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# U.S. NETWORK SERVICES MARKET

1991-1996



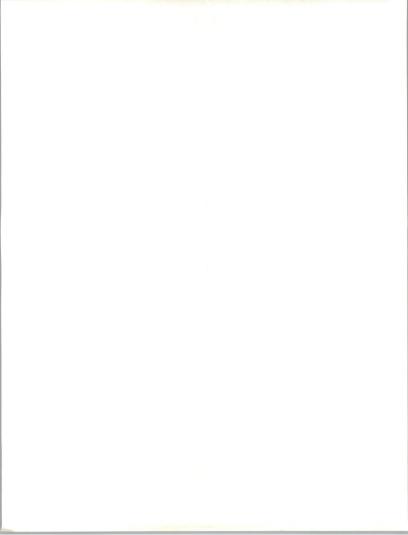
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### Market Analysis Program (MAP)

U.S. Network Services Market, 1991-1996

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MANS1 • 506 • 1991



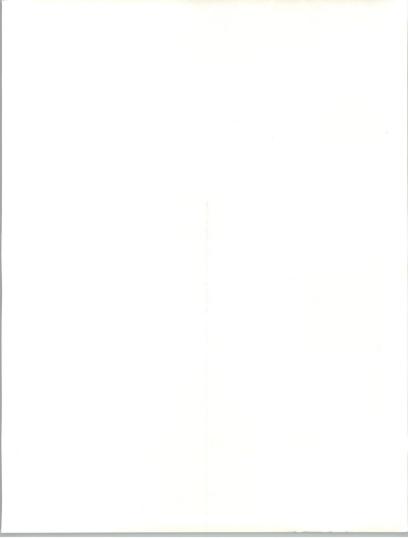
## Abstract

This report is the 1991-1996 analysis and forecast for the network services sector of the U.S. information services industry.

The network services sector consists of two submodes: network applications and electronic information services. Network applications includes electronic data interchange, electronic mail, value-added applications and other application-related services. Electronic information services includes on-line data bases and news services.

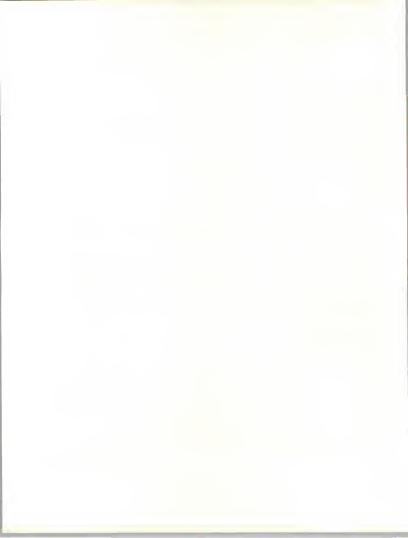
The report gives an assessment of the issues and trends affecting these rapidly growing segments of the U. S. information services industry, projects the growth rate for user expenditures for these services for 1991 through 1996, and profiles leading vendors and their competitive strategies within this market sector. Market growth estimates are provided for fifteen industry sectors.

The report contains 120 pages and 67 exhibits.



# **Table of Contents**

I	Introduction	I-1
	A. Purpose and Organization	I-1
	1. Purpose	I-1
	2. Organization	I-2
	B. Scope and Methodology	I-4
	1. Scope	I-4
	<ul> <li>Information Services Industry Structure</li> </ul>	I-4
	b. Delivery Mode Description	I-7
	2. Methodology	I-8
	a. Base-Year Expenditure Calculations	I-10
	b. Market Forecasts	I-10
	C. Economic Assumptions	I-11
	D. Related Reports	I-11
	1. U.S. Markets	I-11
	2. European Markets	I-11
П	Executive Overview	II-1
	A. User Issues	II-1
	B. Driving Forces	II-2
	C. User Expenditures	II-3
	D. Vendor Competition	II-5
	E. Conclusions and Recommendations	II-6
	1. Conclusions	II-6
	2. Recommendations	II-8
Ш	General Business Climate	III-1
	A. 1990 Results	III-1
	B. Driving Forces	III-3
	C. Key Trends	III-4
	1. Economic Impacts	III-4
	2. Globalization	III-6
	<ol><li>Influence of Large Vendors</li></ol>	III-6



# Table of Contents (Continued)

Ш	4. Outsourcing (Buy versus Make)	Ш-8
	a. Systems Management	III-9
	b. Solutions Buying	III-10
	<ul> <li>Applications Maintenance and Applications</li> </ul>	III-10
	Management	
	5. Shifting Technology Foundation	III-11
	6. The Changing Buyer	III-13
	D. Summary	III-14
ΙV	Information Services Environment	IV-1
	A. Current Usage Determinants	IV-1
	B. User Evaluation of Network Services	IV-8
	C. Future Opportunities	IV-12
V	Issues and Trends	V-1
	A. Introduction	V-1
	B. Major Issues of Network Services Buyers	V-1
	C. Major Issues of Network Services Vendors	V-3
	D. Major Trends in Network Services	V-6
	E. Driving Forces in the Network Services Market	V-7
	F. Growth Inhibitors in the Network Services Market	V-9
 VI	Market Forecast	VI-1
	A. Market Overview	VI-1
	B. Industry Structure	VI-2
	C. Market Structure	VI-2
	D. Network Services Market	VI-3
	1. Overall Market	VI-3
	2. User Expenditures by Industry and Generic Sectors	VI-4
	3. Electronic Information Services (EIS) Market	VI-7
	4. Network Applications Market	VI-11
	5. EDI Market	VI-13
 VII	Competition	VII-1
	A. Introduction	VII-1
	B. Market	VII-1
	1. Market Leaders	VII-1



# Table of Contents (Continued)

VII		2. Market Segments	VII-4
	C.	Vendor Profiles	VII-8
		1. BT Tymnet	VII-9
		a. Company Strategy	VII-9
		<ul> <li>b. Company Background</li> </ul>	VII-9
		<ul> <li>Products and Services</li> </ul>	VII-9
		<ol><li>CompuServe, Inc.</li></ol>	VII-10
		a. Company Strategy	VII-10
		<ul> <li>b. Company Background</li> </ul>	VII-10
		<ul> <li>Products and Services</li> </ul>	VII-10
		<ol><li>Equifax, Inc.</li></ol>	VII-11
		a. Company Strategy	VII-11
		<ul> <li>b. Company Background</li> </ul>	VII-11
		<ul> <li>Products and Services</li> </ul>	VII-11
		4. RAILINC Corporation	VII-12
		<ol> <li>Company Strategy</li> </ol>	VII-12
		<ul> <li>b. Company Background</li> </ul>	VII-12
		<ul> <li>Products and Services</li> </ul>	VII-12
		<ol><li>Sterling Software, Inc.</li></ol>	VII-13
		<ol> <li>Company Strategy</li> </ol>	VII-13
		<ul> <li>b. Company Background</li> </ul>	VII-13
		<ul> <li>Products and Services</li> </ul>	VII-13
		<ol><li>Triad Systems Corporation</li></ol>	VII-14
		<ol> <li>Company Strategy</li> </ol>	VII-14
		<ul> <li>b. Company Background</li> </ul>	VII-14
		c. Products and Services	VII-15
VIII	Con	clusions and Recommendations	
		Conclusions	VIII-1
	В.	Recommendations	VIII-3
Appendixes	A.	Definition of Terms	A-1
* *	В.	Forecast Data Base	B-1



# **Exhibits**

I	-1	Market Reports Format	I-3
L		Information Services Industry Structure—1991	I-5
		Delivery Mode versus Market Sector—Forecast Content	I-6
	-4	Network Services Market Structure	I-7
		INPUT Research Methodology	I-9
II	-1	Network Services—Major Buyer Issues	II-1
		Network Services—Driving Forces	II-3
		Network Services Market Overview	II-4
	-4	U.S. Network Services Market, 1990-1996	II-5
		Leading Vendors of Network Services in 1990	II-6
		Conclusions and Recommendations	II-7
Ш	-1	U.S. Information Services Industry, 1970-1990	III-1
111	-2	U.S. Information Services Industry—Annual Growth Rate	
	-3	U.S. Information Services Industry—1990 Results Summa	rv III-3
		U.S. Information Services Industry—Primary Driving	III-4
	-	Forces, 1991-1996	
	-5	Leading Information Services Vendors' 1990 U.S. Revenu	es III-7
		Outsourcing—Buy versus Make, Key Trends	III-9
		New Technology Foundations	III-11
IV	_1	Growth in Network Services in Selected Industries	IV-1
14		Factors Encouraging Use of Network Services	IV-3
		Primary Reasons for Use of Network Services	IV-4
		Network Services Characteristics Expected by Clients/	IV-6
		Prospects	14-0
	-5	Technological Factors Encouraging Use of Network Services	IV-7
	-6	Factors That Can Discourage Increased Use of Network Services	IV-8
	-7	Alternatives to Network Services	IV-9
	-8	Impact of End Users on Network Services Selection and Operation	IV-10
	-9	Problems/Complaints about Network Services	IV-11
		Improvements and Changes Desired in Network Services	IV-12
		Future Plans of Users of Network Services	IV-13
		Growth of Network Services Foreseen by Users and Prospects	IV-14



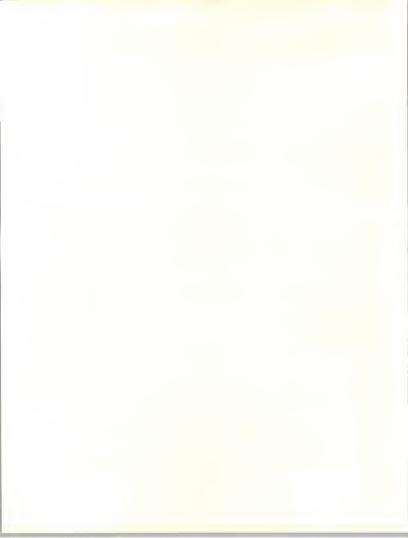
# Exhibits (Continued)

V -1	Network Services—Major Buyer Issues	V-2
	Network Services—Major Vendor Issues	V-4
	Network Services—Major Trends	V-6
	Network Services—Driving Forces	V-7
	Network Services—Growth Inhibitors	V-9
VI -1	Network Services Market Overview	VI-1
	Network Services Market Structure	VI-3
-3	U.S. Network Services Market, 1990-1996	VI-4
	Network Services Market—Industry and Generic Markets, 1991-1996	VI-5
-5	Network Services Market—User Expenditures by Industry, 1991-1996	, VI- <del>c</del>
-6	U.S. Electronic Information Services Market, 1990-1996	VI-8
-7	Electronic Information Services Market—Industry and Other Sectors, 1991-1996	VI-8
-8	Electronic Information Services Market by Submode, 1991-1996	VI-9
-9	Electronic Information Services Market—User Expenditures by Industry, 1991-1996	VI-10
-10	U.S. Network Applications Market, 1990-1996	VI-11
	Network Applications Market—User Expenditures by	VI-12
	Industry, 1991-1996	
	The U.S. EDI Services and Software Market, 1991-1996	VI-13
-13	EDI Market Growth by Delivery Mode, 1991-1996	VI-14
	Leading Vendors of Network Services in 1990	VII-2
-2	Product/Service Focus of Leading Network Services Vendors	VII-3
-3	Leading Vendors of Electronic Information Services in 1990	VII-4
-4	Leading On-Line Data Base Vendor Market Focus	VII-5
	Comparison of Electronic Information Services and Network Application Vendors	VII-7
6	Leading Vendors of Network Applications in 1990	VII-7
	Vendors Profiled in This Report	VII-8
VIII -1	Conclusions	VIII-1
	Recommendations	VIII-4



# Exhibits (Continued)

Appendixes	Α		
	-1	Information Services Industry Structure—1991	A-5
	-2	Industry Sector Definitions	A-14
	-3	Delivery Mode versus Market Sector—Forecast Content	A-20
	-4	Vendor Revenue to User Expenditure Conversion	A-22
	В		
	-1	Network Services—User Expenditure Forecast by Market Sector, 1990-1996	B-2
	-2	Electronic Information Services—User Expenditure Forecast by Market Sector, 1990-1996	B-3
	-3	Network Applications—User Expenditure Forecast by Market Sector, 1990-1996	B-4
	-4	1991 MAP Data Base Reconciliation—Network Services Market	B-5
	-5	1991 MAP Data Base Reconciliation—Electronic Information Services Market	B-6
	-6	1991 MAP Data Base Reconciliation—Network Applications Market	B-7





# Introduction

This report is part of a series of market analysis reports written each year by INPUT on the key segments (delivery modes) of the U.S. information services industry. The delivery modes analyzed during 1991 are as follows:

- 1. Applications Software Products
- 2. Turnkey Systems
- 3. Processing Services
- 4. Systems Software Products
- 5. Network Services
- Professional Services
- 7. Systems Integration
- 8. Systems Operations

The first six delivery modes are covered in reports included as part of INPUT's Market Analysis Program (MAP), a planning service for information services vendors. The last two delivery modes are covered in market analysis reports included in INPUT's Systems Integration and Systems Operations programs.

### A

### Purpose and Organization

#### 1. Purpose

This report analyzes the network services delivery mode of the U.S. information services industry.

 The report includes five-year forecasts, an assessment of market drivers, analysis of competitive trends, and identification of leading yendors



 The report assesses trends and events within the U.S. economy, the U.S. information services industry, and the systems software delivery mode to provide the reader with a comprehensive foundation for understanding this market sector and for anticipating future directions.

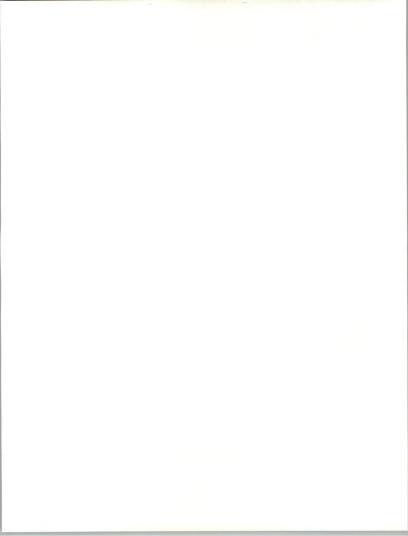
The report provides readers with insights and information that will help them:

- · Review the forces shaping the market
- · Develop internal corporate financial projections
- · Identify new markets and product and services opportunities
- · Assess the competitive trends
- · Determine potential market directions
- Assist in prioritizing investments

### 2. Organization

This report is organized as described in Exhibit I-1. Each delivery mode report within the Market Analysis Program follows this format. The industry and cross-industry sector reports, described below, follow a very similar format.

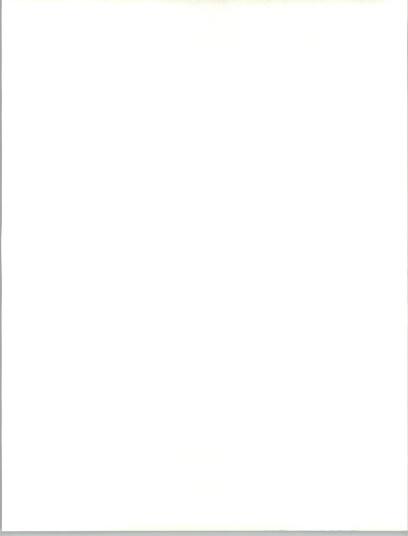
This report is published in segments throughout the year to subscribers to INPUT's Market Analysis Program. Subscribers will receive the material as the research and analysis is completed, with the first chapters shipped in the second quarter. The forecast is shipped in the third quarter.



#### EXHIBIT I-1

## **Market Reports Format**

- Introduction
  - Introduction and definition of the delivery mode and its substructure or segments.
- II Executive Overview
  - Synopsis of the entire report, written at the end of the year.
- II. General Business Climate
  - An overview of the business climate within the information services industry as a whole and the particular market segment of each report.
- IV. Information Systems Environment
  - The information systems environment and user perspective as it relates to the specific delivery mode or market.
- V. Vendor Issues and Trends
  - An assessment of the delivery mode from the vendor point of view.
- VI. Information Services Market Forecast
  - Presentation of the information services market forecast by delivery mode and submode.
- VII. Competitive Environment
  - Discussion of the competitive environment for information services within the delivery mode—with market share analysis and vendor profiles.
- VIII. Conclusions and Recommendations.
  - · Summary of risks and opportunities.
- A. INPUT Definition of Terms
  - Definitions and descriptions of market structure and terms used throughout INPUT's reports.
- B. Forecast Data Base
  - A detailed forecast by delivery mode, submode, and industry/cross-industry sector. Contains a reconciliation to the previous year's Appendix B.



### Scope and Methodology

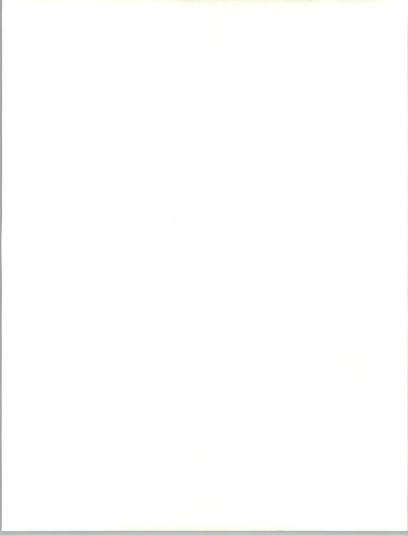
#### 1. Scope

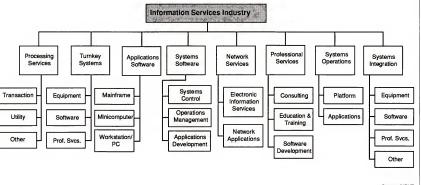
This report addresses the U.S. information services industry for the network services sector (delivery mode). It includes user expenditures that are noncaptive and generally available to vendors. Many large organizations have portions of their information services requirements satisfied by internal divisions. The resulting expenditure is not available for competitive bid by the general vendor community and is not included in INPUT's projections. The noncaptive distinction is important and is addressed in more detail in Appendix A.

### a. Information Services Industry Structure

Exhibit I-2 defines the structure of the information services industry as used by INPUT in its market analysis and forecasts. The industry consists of eight delivery modes, each of which contains a number of submodes.

- Delivery modes are specific products and services that satisfy a given user need. Market sectors specify who the buyer is, and delivery modes specify what the user is buying.
- INPUT develops a five-year forecast for the delivery mode and each of the submodes.

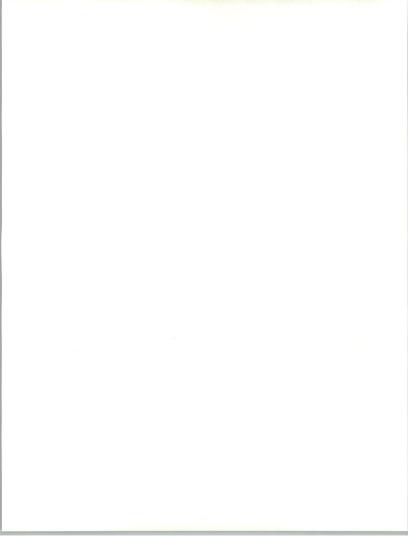




3

Source: INPUT

U.S. NETWORK SERVICES MARKET, 1991-1996



INPUT also publishes market sector reports analyzing 15 industry and 7 cross-industry market sectors. These reports, published annually by INPUT, analyze the information services opportunities in industry sectors such as insurance, transportation, and discrete manufacturing—and in cross-industry sectors such as accounting, human resources and office systems.

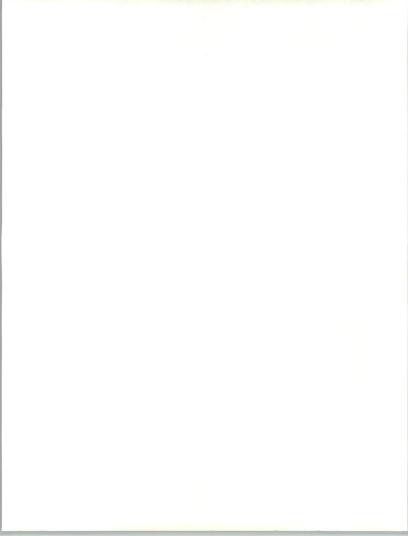
The relationship between delivery mode forecasts and market sector forecasts is shown in Exhibit I-3.

For a more complete discussion of INPUT's information services industry structure and market sector definitions, please refer to INPUT's *Definition of Terms*.

#### EXHIBIT I-3

## Delivery Mode versus Market Sector Forecast Content

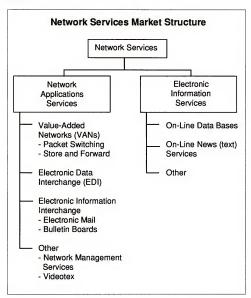
		Market Sectors		
Delivery Mode	Submode	Industry Sectors	Cross-Industry Sectors	Other
Processing Services	Transaction Utility Other	X	x	X X
Turnkey Systems		Х	Х	
Applications Software Products		Х	Х	
Systems Operations	Platform Applications	X X		
Systems Integration		Х		
Professional Services		Х		
Network Services	Network Applications Electronic Information Services	X		х
Systems Software Products				Х

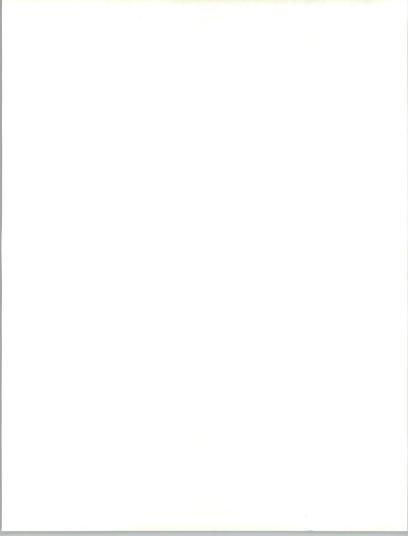


### b. Delivery Mode Description

The structure of the network services delivery mode, as shown in Exhibit 1-4, is composed of electronic information services and network applications.

EXHIBIT I-4



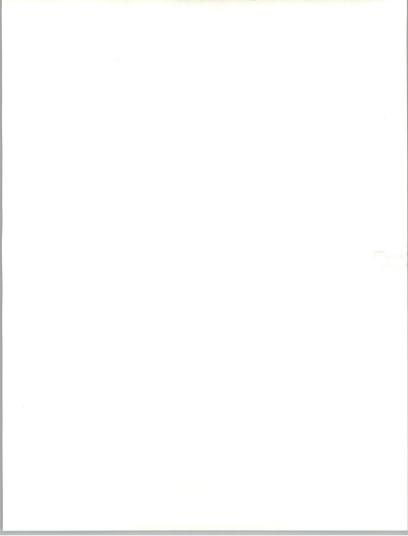


- The two submodes within the network services delivery mode electronic information services and network applications—are described in full in Appendix A.
- All network application services are considered as purchased by specific industry sectors, that is, they are industry specific. Thus the forecasts for network applications within the 15 industry sectors add to the total of the forecasts for the delivery mode as a whole. Electronic information is purchased as industry specific as well as on a generic basis across industries.
- Network services sold in conjunction with processing services are included in the definition of the network services sector.

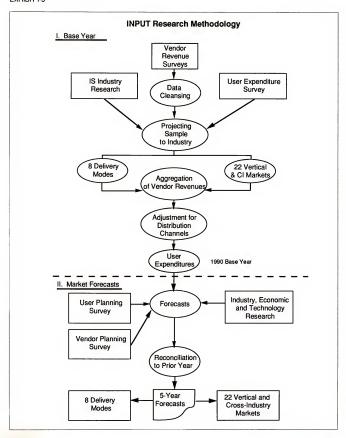
### 2. Methodology

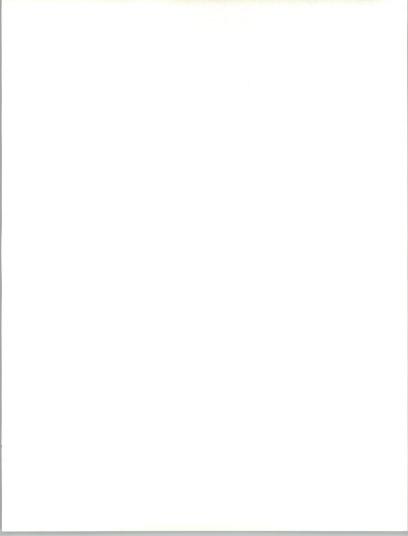
INPUT's methodology for market analysis and forecasting is summarized in Exhibit 1-5. As in past years, INPUT has continued to survey information services vendors to determine their U.S. information services revenues, and to query information systems organizations about expenditures and outside services acquisition plans. INPUT interviewed vendors a second time to understand their views of market opportunities over the short and long terms.

INPUT's annual forecasting process is broken into two major parts: base-year expenditure calculations and market forecasts. Each is briefly described below.



## EXHIBIT I-5





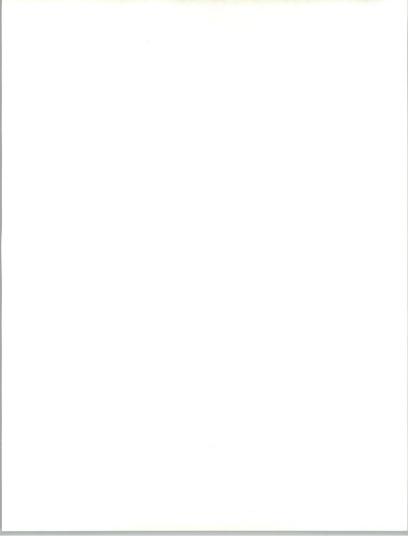
### a. Base-Year Expenditure Calculations

- INPUT determines previous-year information services revenues for the eight delivery modes and 22 industry and cross-industry sectors for hundreds of vendors. Estimates rely upon interviews, public data, and INPUT's own estimates.
- The initial data are projected to represent the entire information services industry.
- Adjustments are made to eliminate duplications due to distribution channel overlap and to assure that captive information services expenditures are not included.
- The result is a base-year (1990) user expenditure for each of the 22 vertical and cross-industry sectors and the 8 delivery modes.

### b. Market Forecasts

- In the forecasting step, INPUT surveys information systems executives to determine their projected expenditure levels, both in aggregate and for each of the outside information services categories.
- In addition, a second set of vendor interviews is conducted later in the year to obtain an understanding of how key vendors view the market and its opportunities.
- The result is a five-year forecast for each of the 22 vertical and crossindustry sectors and the 8 delivery modes. The delivery mode and market sector forecasts are correlated according to the diagram in Exhibit 1-3.

To complete the process, INPUT reconciles its new forecasts with those from the previous year. Differences due to market restructuring and other factors are explained. One may use these projections to track INPUT's forecasts from year to year.



## C

# Economic Assumptions

INPUT forecasts are presented in current dollars (i.e., 1996 market sizes are in 1996 dollars, including inflationary forecasts). In developing the five-year forecasts, INPUT has incorporated economic assumptions for the U.S. economy as a whole.

The GNP and GNP Deflator growth rates used in INPUT's market projections for 1991 through 1996 are from the CONSENSUS™ forecast, a product of Blue Chip Economic Indicators of Sedona, Arizona. The Blue Chip CONSENSUS forecast is derived from a leading panel of economists representing leading financial, industrial, and research firms across the U.S. and has a 13-year track record of balanced and accurate projections.

The 1991-1996 assumptions are contained in Chapter VI, Information Services Market Forecast.

### D

# Related Reports

Related reports of interest to the reader are:

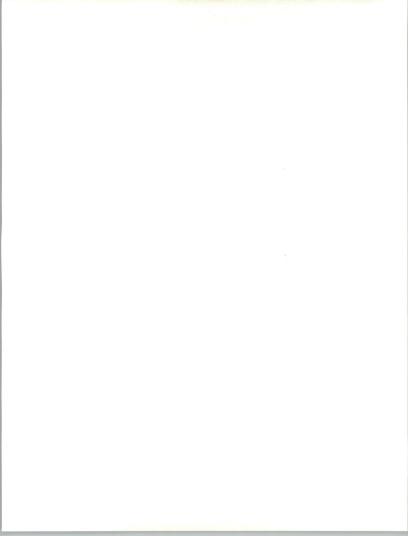
### 1. U.S. Markets

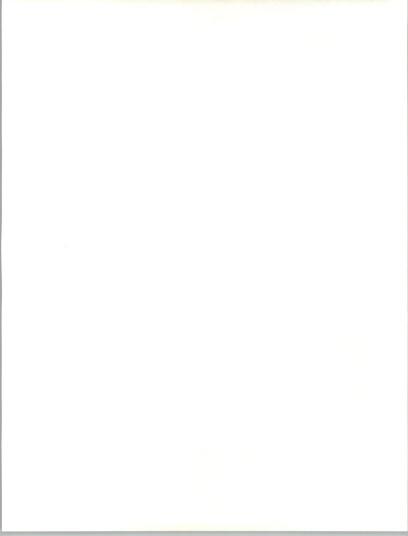
- · U.S. Application Solutions Market Analysis Report, 1991-1996
- U.S. Processing Services Market Analysis Report, 1991-1996
- U.S. Systems Software Products Market Analysis Report, 1991-1996
- U.S. Systems Integration Market Analysis Report, 1991-1996
- · U.S. Systems Operations Market Analysis Report, 1991-1996
- U.S. Industry Sector Markets, 1991-1996 (15 reports on all major industry sectors—e.g., insurance)
- U.S. Cross-Industry Sector Markets, 1991-1996 (7 reports on information services markets that serve all vertical industry sectors—e.g., accounting)

# 2. European Markets

- The Western European Market for Computer Software and Services, 1991-1996
- Systems Software Products—Western Europe, 1991-1996
- Trends in Processing Services—Western Europe, 1991-1996
- Systems Integration Market Forecast—Western Europe, 1991-1996
- Systems Operations Market Forecast—Western Europe, 1991-1996
- Western European Network Services Markets, 1991-1996

The European markets are also analyzed on a vertical basis for discrete and process manufacturing, insurance, banking and finance, and retail and wholesale distribution.







# **Executive Overview**

### A

# User Issues

As indicated in Exhibit II-1, the revenues and earnings of some users of network services have suffered from the lengthy recession, and this in turn has affected the use of network services. This effect is most notable in the banking and finance industry, where growth in the use of network services—and particularly electronic information services (EIS)—will be impacted through 1996.

## **EXHIBIT II-1**

# Network Services Major Buyer Issues

- Revenues and earnings have not recovered.
- · Desire for increased vendor productivity
- More concern about planning and justifying network services
- · Recognition of product/service need
- · Complexity of using EIS
- Pressure on network planning

Listed in order of importance.

The impact of the recession has made users interested in obtaining more productivity from vendors in terms of lowered prices and increased services.



- New vendors have entered the EIS market with lowered prices for online data bases, as well as CD/ROM data bases for data that is less volatile.
- Vendors of network applications are offering more aid and more simple services such as the GEIS product, EDI\*Express.

Due to the impact of the recession, users of network services are more concerned with justifying the use of this information services mode, as Fxhibit II.1 indicates.

- The use of an additional on-line data base or a network application may require the tabulation of specific savings or revenue increases that will justify the action.
- Users report that they are more concerned about planning and justifying the use of network services than they were before the recession. Particularly in the financial industry, it was once possible to add services with little justification.

There is recognition of the need for a certain level of network services, however.

- Brokerage managers report that customers expect to have on-line information.
- Major firms are forcing suppliers to use EDI, and many user application systems require VANs.

As Exhibit II-1 also notes, users are concerned about the complexity in using EIS, particularly in using multiple EIS. This complexity can impede expanded use. The use of network services also requires that many users analyze their own network plans because they may have to link their networks to vendor networks at multiple points and/or accommodate different protocols and speeds.

### В

# **Driving Forces**

The increasing need for EIS (on-line data bases) to supply prices and information to aid with planning or decision making—or to supply information on chemicals, materials, production processes, or other subjects to meet business, university, and government requirements—is a major driving force for the use of network services, as Exhibit II-2 notes.



### **EXHIBIT II-2**

# Network Services Driving Forces

- Increasing need for electronic information
- Growing pressure to use network applications
- Improving network capabilities
- Lack of expertise in network technology and applications
- · Potential revenues and savings
- · Increased interest of end users

Listed in order of importance.

The use of EIS can support the revenues of some organizations by meeting the needs of customers or saving the costs required to obtain information by other means. These concrete benefits are also driving the use of network services.

The use of network applications is driven by the need to reduce costs as well as use electronic means to speed the flow of information.

Improving network capabilities drives the use of EIS and network applications by increasing the number of points where information can be accessed and thus increasing the ability to connect networks and increase speeds of transmission.

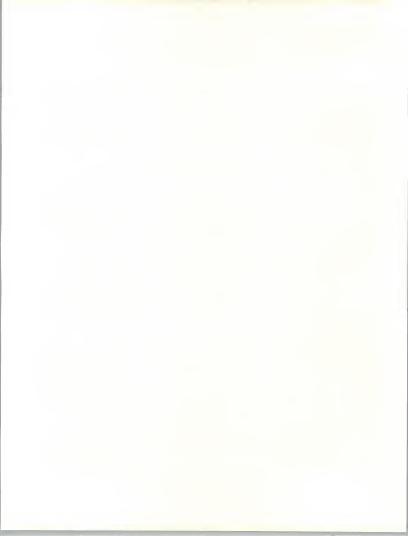
As Exhibit II-2 indicates, the lack of expertise in network capabilities also helps to drive the use of network services vendors.

- In order to market and deliver their products, vendors have developed a staff with these capabilites.
- End users that are in need of on-line data or want to utilize network applications can become involved with network services vendors to obtain aid, which can lead to the consideration of vendor capabilities.

#### C

# **User Expenditures**

The overview of user expenditures for network services in Exhibit III-3 shows that forecasts made in 1990 for the 1990 and 1991 market are on target with the actual results because the impact of the recession was anticipated.



- The forecast of \$8.1 billion in user expenditures agrees with 1990 results
- The forecast of 1991 expenditures in 1990 agrees with the forecast of \$9.4 billion in 1991.
- The 1990 forecast of the 1990-to-1995 compound annual growth rate is 17%, the same as the 1991 forecast for 1991 to 1996.

### **EXHIBIT II-3**

# Network Services Market Overview (\$ Billions)

1990 Outlook		1991 Outlook	
1990 Forecast - 8.1	versus	1990 Actual - 8.1	
1991 Forecast - 9.4	versus	1991 Forecast - 9.4	
1990-1995 Forecast Growth Rate - 17% (CAGR)	versus	1991-1996 Forecast Growth Rate - 17% (CAGR)	

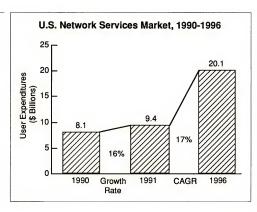
The forecast totals for the network services market in 1991 and 1996, which is shown in Exhibit II-4, reveal that the total has fallen below previous expectations for 1996.

- The total of user expenditures forecast for 1991 is only about \$50 million below expectations, but by 1995 the total will be more than \$500 million below expectations.
- The drop in anticipated user expenditures is due mostly to the impact of the recession on the use of network services—particularly EIS—in banking and finance.

The growth rate of 17% for network services between 1991 and 1996—which Exhibit II-4 shows—is still one of the highest rates for an information services mode.



EXHIBIT II-4



D

# Vendor Competition

The top five vendors of network services in Exhibit II-5 include only vendors of one submode of network services, EIS. There are two vendors of network applications among the next five largest vendors.

Four of the top five vendors have EIS products for financial subjects, and the other vendor, Mead Data Central, has EIS products that offer legal information and news.

- · Two of the vendors, TRW and Equifax, offer credit-related EIS.
- Dow Jones (Telerate) and Dun & Bradstreet offer financial details and corporate product and market information.

Four of the top five vendors are subsidiaries of companies that have substantial revenues in non-information-services areas. Four of the next five vendors have the same characteristic.

Only two of the top five vendors offer other modes of information services. Dun & Bradstreet offers software products, and Equifax offers processing services as a result of its acquisition of Telecredit.



Two of the top five vendors have had problems with rising costs in the delivery of EIS. These problems may have resulted from the limited experience of these firms in delivering information services.

The top five vendors control 29% of the U.S. market for network services, and the next five vendors control about 15% of the market.

- · Altogether, the top 10 vendors control just under half of the market.
- There is little chance that one of the small vendors offering EIS products could move into the size range of the larger vendors.

## **EXHIBIT II-5**

# Leading Vendors of Network Services in 1990

Rank	Vendor	Estimated Revenue (\$ Millions)	Market Share (Percent)
1	TRW (including Chilton)	700	9
2	Dow Jones (Telerate)	425	5
3	Dun & Bradstreet	415	5
4	Mead Data Central	410	5
5	Equifax	390	5

### F

## Conclusions and Recommendations

### 1. Conclusions

As indicated in Exhibit II-6, the recession will have an impact on network services but mostly on one industry sector.

- The compounded annual growth rate for user expenditures for the banking and finance sector for the period from 1991 to 1995 is being reduced by about one-third from the previous five-year forecast as a result of the recession. The impact is highest in the EIS submode.
- Growth rates in several other indutry markets were reduced but much less significantly.



 Growth rates in some industries have stayed the same or increased slightly as a result of need for network services.

### **EXHIBIT II-6**

## Conclusions and Recommendations

- Conclusions
  - Impact of recession is selective
  - Interaction of technology and business marks use of FIS
  - Positive impact of network technology
  - Healthy growth in market
  - Narrow range of vendor markets and services
  - Increasing use of EDI and electronic commerce
- Recommendations
  - Review actions of other network services vendors
  - Expand markets and services
  - Offer related or complementary products and services
  - Non-network services vendors should consider market

The use of new or different technology can have an impact on the use of EIS as noted in Exhibit II-6.

- The use of CD/ROM for more static information is having an impact on the use of EIS.
- The use of digitized information that can be manipulated by workstations and the supply of EIS through a variety of network options has had positive impacts on EIS vendors.

Advancements in network technology also produce continuing positive impacts on network services by improving access and delivery speeds.



The network services market continues to grow at a fast rate relative to most information services due to the need for on-line information to aid in financial markets, decision making, research and production and the need for network applications that can save time and/or money by substituting electronic messages for paper ones.

The substitution of electronic messages for paper ones is most dramatic in the use of EDI and electronic commerce.

- Major companies are taking much stronger stands to encourage or force suppliers to use these methods.
- Large corporations report that they are modifying application systems to utilize electronic interchange of ordering and payment information.

The vendors in the marketplace who are taking advantage of the demand for network services and the ongoing improvements in network technology tend to offer a narrow range of services and/or serve a narrow range of markets in general with some notable exceptions including GEIS and CompuServe.

## 2. Recommendations

As noted in Exhibit II-6, network services vendors should review the actions of competitors.

- Some vendors of EIS have started to take steps to make their operations less costly.
- A few network services vendors have started to broaden their range of services. Equifax has acquired Telecredit, a processing services vendor serving banks and retail business. Knight-Ridder has added an EIS that has strong appeal to the financial industry.

Network services vendors should find out whether the activities discussed above have positive effects on the vendors involved and if other vendors make similar moves.

Vendors should also learn when new CD/ROM products are being introduced that might have an impact on their EIS or when a development in electronic commerce might offer opportunities or competition to their EDI products.

Steps should be taken to broaden the range of services offered in any case to offset possible competition in the markets and products served.

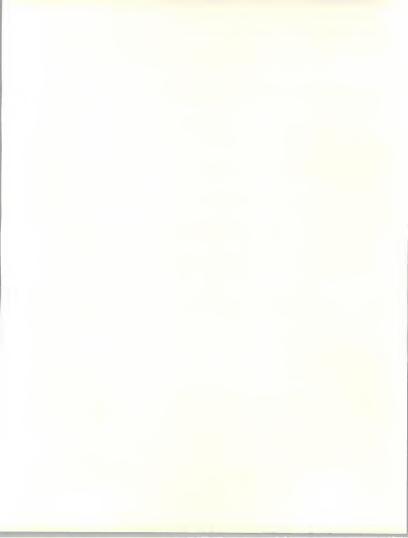


Vendors of EIS should consider offering CD/ROM products that would be complementary to their EIS rather than let competitors do it. It might also be possible for them to offer software products that would aid users to coordinate the use of EIS and CD/ROM products.

Non-network services vendors should also consider entering the market to take advantage of the fast growth rates for EIS and network applications that could be related to the processing or other information services that they offer.

- Sterling has used its knowledge and capabilities in the retail distribution area to provide products and gain a reputation in the EDI market.
- Vendors of processing services such as Triad and Reynolds and Reynolds have utilized EIS related to their application systems to expand revenues.







# General Business Climate

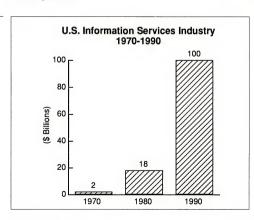
In this chapter INPUT provides an overview of the current business climate for the U.S. information services industry and for the network services delivery mode.

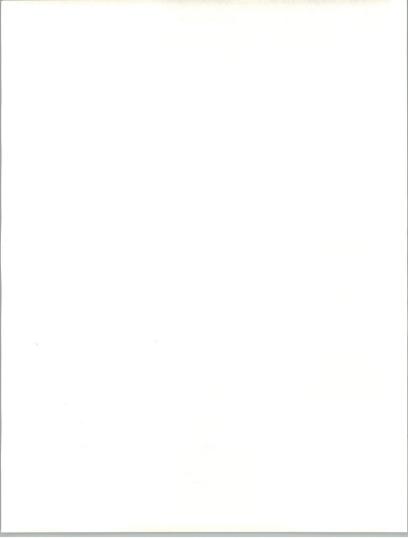
### A

# 1990 Results

In 1990, the U.S. information services industry reached a milestone, ending the decade at about \$100 billion in size. As Exhibit III-1 shows, the industry increased in size over five times during 1980s and is 50 times larger than it was in 1970, when the industry represented \$2 billion in user expenditures.

# EXHIBIT III-1

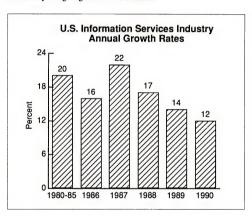




During 1990, the industry grew at just under a 12%—from about \$90 billion to \$100 billion. As Exhibit III-2 indicates, 1990 reflects an intensification of a decline that started in 1989. The average annual growth during the first eight years of the decade was over 19%.

Worldwide, the industry continues to experience greater growth rates of close to 20%, and many U.S. vendors are experiencing growth that exceeds that of the U.S. industry as a whole. This growth is primarily due to international sales, but is also due to the focus on specific industry markets. Inflation rates and somewhat stronger economies are driving the industry to higher growth levels overseas.

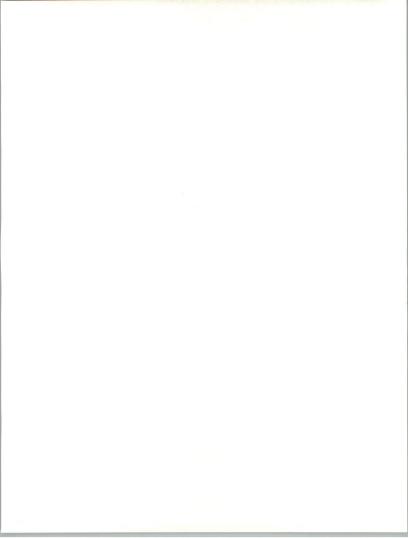
### EXHIBIT III-2



On a delivery mode basis:

- The smaller systems integration, systems operations, and network services delivery modes are growing faster than the rest of the industry.
- The software products sectors grew at or slightly above the industry average.
- The larger professional services and processing services sectors, as well as the smaller turnkey systems sector, are growing slower than the industry average.

Exhibit III-3 summarizes 1990 results.



### EXHIBIT III-3

# U.S. Information Services Industry 1990 Results Summary

- Reached the \$100 billion milestone
- · Growth 2 to 3 times the economy continues
- Growth slowed in 1990 relative to 1989
- · Economy causes confusion

The five-year forecast for network services growth fell from 20% to 17% in 1991. Growth in the use of EIS fell due to decreased market activity, and plans for network applications were delayed due to the economic downtum.

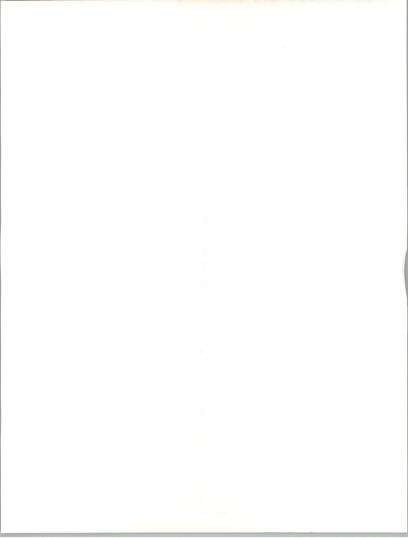
Although the economic downturn was the principal factor causing the drop in growth of information services, it did not have an equal impact on the use of network services in different markets or on the vendors offering these services. Several major vendors as well as smaller ones showed growth of over 20%. Other vendors experienced reductions in revenue and earnings growth. As a result, many vendors are evaluating changes in objectives and market strategies, as well as in operational staffing and processing, to reduce costs.

### Ŀ

# **Driving Forces**

There are a number of fundamental forces impacting the information services industry in the 1991-1992 timeframe that will have measurable impact on the overall growth rate for the 1991-1996 five-year period covered by this market analysis report. Each force will affect the industry as a whole, as well as each of the eight delivery mode sectors used by INPUT to analyze the industry and its key trends.

Exhibit III-4 identifies six primary driving forces impacting the U.S. information services industry. The impacts are multidimensional, fundamental, and long lasting. Each is discussed in this chapter and throughout this report.



#### EXHIBIT III-4

## U.S. Information Services Industry Primary Driving Forces, 1991-1996

- · The economy
- Globalization
- · Influence of large vendors
- Outsourcing (buy versus make)
- · Shifting technology foundation
- · The changing buyer

## C

## Key Trends

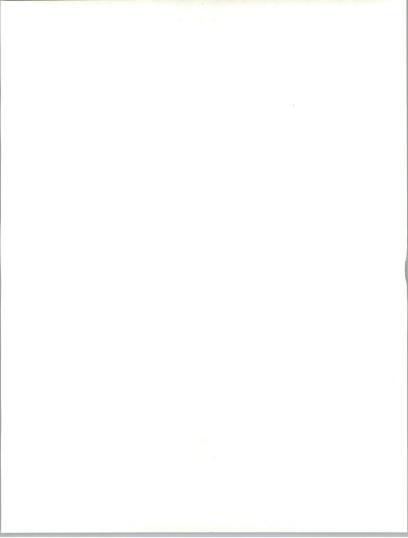
#### 1. Economic Impacts

The economy, as well as the overall size of the information services industry, is a significant factor in the user expenditure level for information services and software products.

- The inflation rate of the past few years has been much more modest than in the mid-1980s. INPUT forecasts and market sizes are in current dollars—thus lower inflation means lower growth.
- Real economic growth had been modest over the past few years prior to the recession that started in late 1990. Deferred and canceled expansion plans in all industry sectors certainly slow the expansion of information services expenditures.
- The shift of information processing to smaller computers lowers the software products investment, based on current pricing practices.
   Quantities of software products sold increase, but revenue levels grow at more modest rates.

In 1990, a year with little to no real growth in the overall economy and inflationary growth of about 5%, the information services industry grew 12%.

- INPUT's 1990 and 1991 economic assumptions were for nominal GNP growth of 5.4%; real GNP growth was 1% or less.
- At this point in 1991 (the second quarter), the economy remains in nogrowth status, with some improvement expected by late in the year. At the same time, inflationary pressures are modest. INPUT expects another modest growth year in 1991 and again in 1992. The expected slow upturn will have the following positive and negative impacts on the U.S. information services industry in the near term:
- · Positive impacts include:
  - Increased motivation to buy rather than make, in particular for larger systems requirements. Response time and impact on business operations are the key criteria.
  - The interest in systems operations, which permits organizations to redeploy capital investments and lower direct headcount, is being reinforced.
  - A tight economy is helping develop interest in lower cost solutions that come from client/server-based applications software products.
- · Negative impacts include:
  - Decision processes are lengthened in a tight economy, causing deferral of major information systems projects and the use of services such as network applications.
  - With tight information systems budgets, the internal information systems staff can be favored over contracted professional services vendors, thus negatively impacting a major segment of the industry.



#### 2. Globalization

INPUT has cited globalization as a driving force for the past three years. During that time markets have opened, vendors have expanded their international focus, and users have begun to expect global capabilities. This is particularly true for network services, where financial electronic information and international network applications are of increasing interest.

- The European market is making progress toward a single market. Now 1992 is less than a year away and many changes are apparent. In addition, the European market is stronger than the U.S. market, although both are suffering in the current economy.
- The worldwide orientation of the larger services vendors is verified by the investments in Europe by Computer Sciences Corporation and Digital Equipment and by the ever-expanding interest of Japanese vendors in the U.S. information services industry.

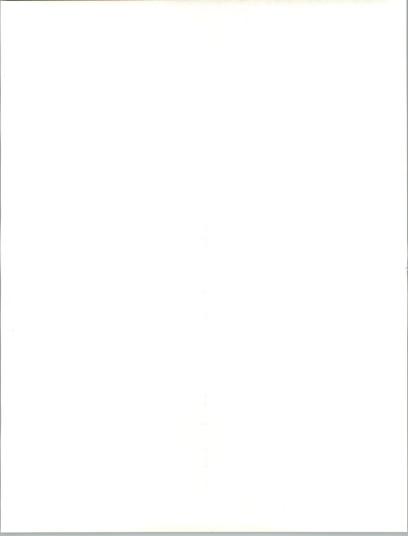
The primary positive impact of globalization is the ability of larger vendors to balance their businesses in multiple markets, with less impact from market downturns.

The primary negative impact of globalization is that it may make it harder for smaller vendors to grow and/or maintain independence.

### 3. Influence of Large Vendors

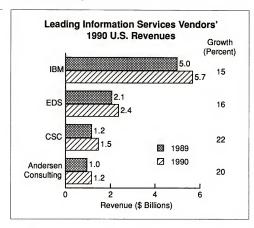
The influence of the larger information services vendors has increased significantly over the past few years.

- The newer systems integration and systems operations sectors, though smaller than more traditional sectors such as professional services and processing services, are growing faster than the traditional sectors and are dominated by the leading vendors.
- Even in network services, large information services vendors—including TRW, ADP, Equifax, GEIS, and IBM—play strong roles, although they are joined by information providers and communicators such as Dun & Bradstreet, Dow Jones, and BT Tymnet.
- A number of larger vendors are growing faster than the overall market. Exhibit III-5 lists four of the largest information services vendors that can be considered multi- or full-service vendors and reveals their U.S. 1989 and 1990 information services revenues. All four increased information services revenues by at least 15%, which is greater than industry growth as a whole.



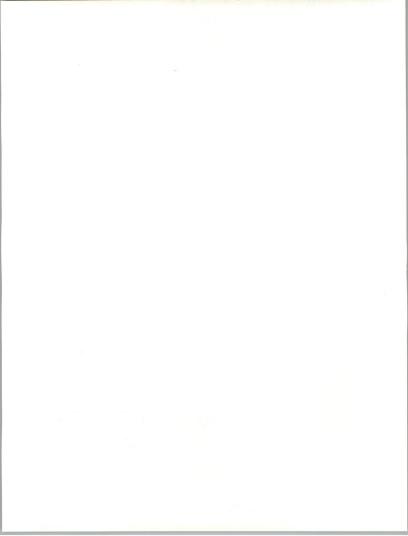
 Certainly there are numerous smaller firms that are also growing faster than the general market, but overall, the dominance of the larger vendors is increasing.

#### EXHIBIT III-5



The large-vendor influence is increasing in other ways as well.

- Starting with IBM, many large services vendors are making minority and majority investments to gain influence on technology, access to software products for remarketing, and market share.
- DEC's investment in Kienzle in Europe and EDS' investment in ASK Computer Systems are two examples of large vendors seeking new channels and resources.
- Consolidation is also a factor. Mergers among the major accounting
  firms have reduced the number of players, but have given two of the
  firms (Ernst & Young and Deloitte Touche) added resources to follow
  the example of Andersen Consulting. In network services, the acquisition of Chilton by TRW illustrates this consolidation.



The increasing use of business consulting linked to professional services has provided a means for the large accounting and consulting firms, as well as some large information services firms, to gain a greater share of the industry. INPUT expects this trend to continue over the next few years. The opportunity for the smaller, more specialized software product or services vendors is not disappearing, but it is changing character.

- Alliances with larger vendors will be essential, at least as secondary sales and support channels.
- Specialization—in terms of the technology used or the industry served, or both—will become more important and common.

The continuing increase in the strength and impact of the larger vendors will have the following positive and negative impacts:

- · Positive impacts include:
  - The larger vendors have the financial strength to minimize the risk of systems management services.
  - The larger vendors have financial resources available to invest in new technologies, often through investment in smaller and specialized firms.
- · Negative impacts include:
  - Alliances may become a requirement for smaller technology firms to survive and prosper.
  - The dominance of the larger vendors will continue to grow.
  - Larger vendors tend to move more slowly, which will hamper development and acceptance of new technology. This slowness will provide opportunity to small vendors that seize technology initiative.

## 4. Outsourcing (Buy versus Make)

Since its inception, the information services industry (services and software products) has tended to outgrow the internal information services budget by continuously creating new products and services that permit the information systems function to outsource (buy versus make). This has always been an outsourcing industry. And though growth has slowed, a number of factors will permit continued growth that exceeds growth in the economy, the computer hardware sector, and the internal information systems budget.



Key trends in outsourcing are listed in Exhibit III-6.

#### FXHIRIT III-6

## Outsourcing Buy versus Make, Key Trends

- Systems management
- · Solutions buying
- Applications maintenance
- Applications management

### a. Systems Management

Outsourcing the management of information systems, or at least significant elements of information systems, continued to gain momentum during 1990. Helped more than hindered by the recessionary economy, the inclination of the general management of large organizations to consider outsourcing increased.

The ability to transfer much of the financial risk and, perhaps more importantly, the technological risk of a project or operations to a specialist has numerous attractions for general management.

- The attraction that will become more and more important will be the ability to disconnect the information technology part of the solution from the business decision. General management is concerned with business results, and does not want to debate the pros and cons of a technology. The appeal of the vendor's offer to take on risk either in a project (systems integration) or in operations (system operations) can only grow during the 1990s.
- The nature of most outsourcing activities within larger organizations
  often makes them favor the large vendors, adding impetus to the trend
  described above. If there is major risk involved, the buyer will bet on
  the company most able to accept risk and take responsibility.

- Perhaps the most important attraction is the ability of buyers to gain access to a broad information technology on an arm's-length business basis in a single decision.
  - The systems integration vendor can provide all the needed expertise in a new technology at the beginning of a project. There is no internal training lag time while the information systems staff gains the knowledge and experience required.
  - The systems operations vendor can provide a full utility-based service at a predictable cost over a number of years. This should make for fewer surprises from the overall information systems program.

## b. Solutions Buying

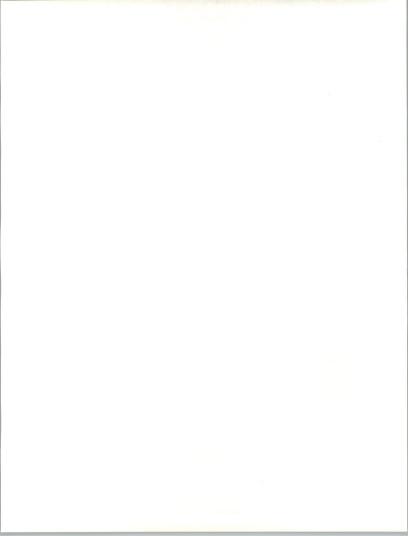
Buying applications software is a well-established practice in the U.S. market where the use of packaged software is commonplace. However, the current change in the way U.S. organizations are managed and the availability of low-cost, high-performance client/server computing is bringing new impetus to the application solutions market.

- The fundamental decentralization of U.S. business management, with the corresponding reduction of corporate staffs, is creating a major requirement for business unit (distributed) application systems. Furthermore, the buyer is not an information systems professional and is willing to outsource (buy) with some customization.
- Just when the smaller business unit needs independent application solutions, there is a hardware revolution to support the need. Client/ server technology provides affordable, high-powered computing.

The ability to find a VAR that can provide a package plus customized systems on client/server-based software is bringing the solution value of systems integration to the decentralized business unit.

## c. Applications Maintenance and Applications Management

In line with the shift to outsourcing systems management to systems integrators and systems operations firms, the buyer is also seeking to gain more-defined relationships with more-traditional professional services vendors. Instead of contracting for temporary personnel, the buyer is beginning to contract for services like applications maintenance and applications management.



- Applications maintenance is contracted, 24-hour support of existing applications systems. The vendor provides a set level of services and interacts directly with the end user.
- Applications management is contracted management of development and maintenance of a set of applications. The vendor provides the software and all of the expertise and staff to ensure that the application is successfully used over an extended period. Applications software products firms can become applications management vendors for their clients or let some other vendor do it.

### 5. Shifting Technology Foundation

Significant new technologies became available in the late 1980s and are gaining momentum in the 1990s. An underlying characteristic of much of this new technology is a shift in the technological foundation. Many elements of technology are shifting to new foundations.

Exhibit III-7 lists the key elements of this shift in underlying technology. Each element is causing organizations to stop and rethink key aspects of their information systems infrastructure strategies. Rethinking can slow the adoption in the short term, and create new vendor opportunities over the longer term.

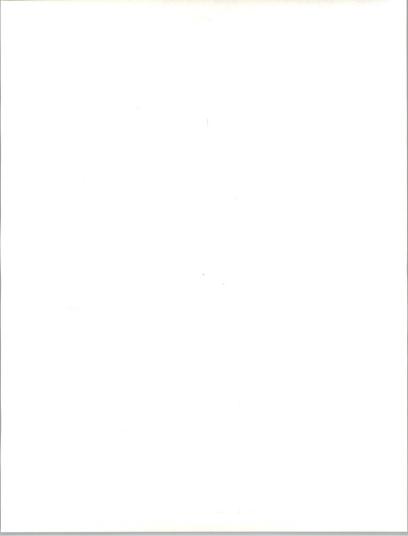
#### **EXHIBIT III-7**

## **New Technology Foundations**

- International standards
- · Graphical user interface
- Client/server
- · Networking and integration
- Distributed data
- Imaging
- Engineered/re-engineered software

All of these new technologies and foundations cause confusion in the industry and with the buyer. Confusion slows buyers' and vendors' decision making. Strategies need to be revised and investment plans shifted, and education is required.

- Standards are driving every major computer manufacturer and software products developer to revise strategies and change product development plans. New products are delayed and then require longer initial sales introductions.
- The user interface of the personal computer in its graphical pull-down
  menu and windowing form will be the only interface acceptable to
  users from now on. The text-based interfaces of the 1970s and 1980s
  will no longer be tolerated. Every major software product developer is
  re-engineering the user interfaces to its products.
- Downsizing, the common term for moving an application to a client/server-based installation, will be the greatest phenomenon of the early 1990s. Whether or not the installation is actually downsized, it will be moved to a new processing location and take on new characteristics. Major re-engineering of internal systems by the information systems function and a shift to buying server-based application products is underway. All of the impacts are not known. One, software products pricing based on the size of the platform will have to change. Certainly some confusion exists and is impacting buying decisions.
- The growing use of PCs, workstations, and LANs has mandated a
  move to integrate the information networks of large and small organizations. Today's networking products permit the distributed applications that have been discussed for years but were never possible.
- The way data is stored and turned into information has been fairly constant since the creation of the first hierarchical DBMS in the early 1970s. Since then the challenge was to build data bases, not to consider building them with new types of components. The shift started with commercial use of relational DBMSs, but it is the distributed DBMS, and perhaps more importantly image processing, that will cause major re-engineering of the data base architectures of larger organizations. Major new investment is required, and of necessity, will come over time.



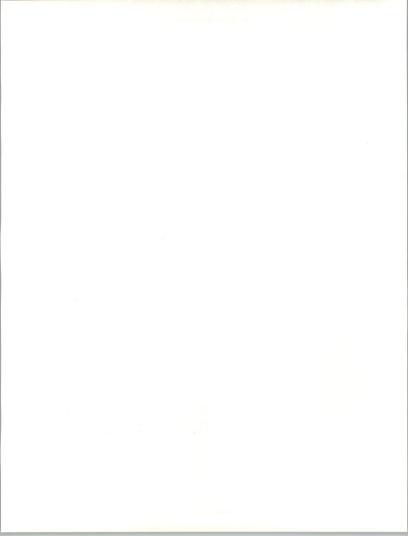
 The age of truly engineered and re-engineered software through CASE technology is dawning. In five years the approach to maintenance will have finally changed and there will have been major advances in programmer productivity.

The positive and negative impacts of the shift in technological foundation are listed below. Certainly over the five-year period of this forecast the positives greatly offset the negatives.

- · Positive impacts from this shifting technology foundation include:
  - New types of solutions will become available.
  - The role of the end user in information systems can continue to expand.
  - Opportunities for new as well as existing vendors are created.
  - Application systems can be increasingly molded to the character of the organizations they support.
- · Negative impacts are:
  - Any shift causes confusion and hesitation in the near term. The magnitude of the current technology shift could cause confusion and slow investment through the middle of the decade.
  - The size of the task to shift to client/server technology in organizations with large centralized systems causes conflicting priorities between re-engineering and meeting new requirements.
  - The technology shift now in process is creating a significant additional training and education requirement.
  - Growth is slowed while the new technology is understood and learned.

## 6. The Changing Buyer

The decision maker for the purchase of information services remained relatively constant until the late 1980s. The information systems executive and key staff (systems development and data center operations managers) decided when to go outside and who to contract with.



This leadership has changed significantly in the past few years and promises to change even further. As the information services vendor moves to provide a full long-term service or a full solution, the general manager is becoming the buyer. The impacts are significant.

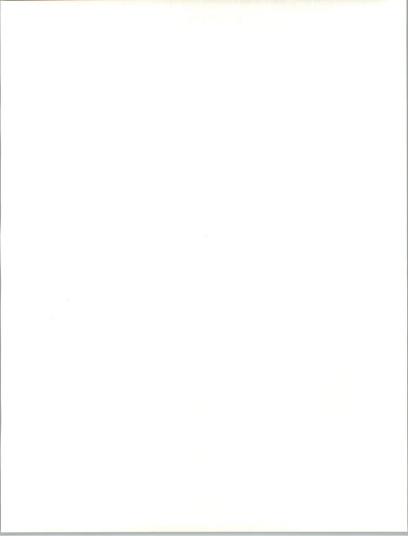
- Technology becomes less important and the business or operational impact becomes more important.
- The impact of the information systems function becomes more consultative and less direct.
- · The ability to try new ideas and approaches is increased.
- The time to completion is controlled by the organization's ability to afford, not the ability of information systems to develop.

## D

## Summary

The year 1991 is exhibiting significant changes from the 1980s. The changes suggest more modest, but continued strong and stable growth for the information services industry.

- An economy that does not shift quickly helps management make longer term decisions, albeit at a slower pace.
- A market of \$100 billion that is strongly impacted by the direction of the larger vendors should be expected to grow somewhat more slowly.
- The increasing tendency of larger organizations to turn to vendors for services that include real and significant elements of systems management and have a solutions orientation will lead to larger, longer term decisions—decisions that can take longer to make but have a lasting impact.
- The shift in the underlying technology foundation is for the better—more valuable and productive applications solutions will result. But shifts bring re-engineering, reinvestment, and retraining—and require time and money.
- The role of the general manager concerning the deployment of information technology continues to increase. In many instances the general manager is more influential than the information systems manager, particularly regarding major decisions. Over time the general manager's influence will have positive impacts on the size and growth of the information services industry—as long as the vendors provide satisfaction.





## Information Services Environment

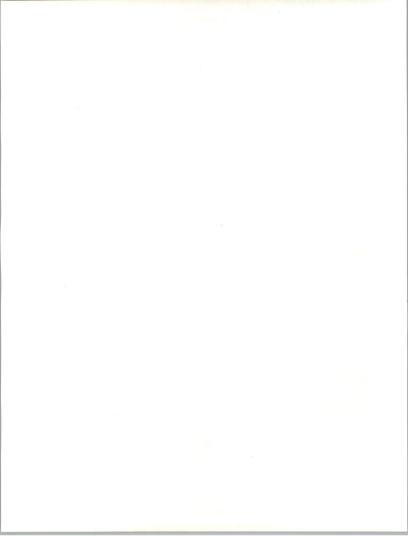
A

Current Usage Determinants As Exhibit IV-1 indicates, the growth rate for network services varies markedly by industry. This exhibit also shows that network services has a wide range of growth rates among different industries:

**EXHIBIT IV-1** 

# Growth in Network Services in Selected Industries

	Growth in Calendar Year (Percent)		
Industry	1989	1990	1991
Banking	33	22	21
Telecommunications	28	29	26
Discrete Manufacturing	22	26	21
Insurance	19	9	10
Utilities	21	5	8
Federal Government	21	10	10



- Six of the 16 industries tracked by INPUT had growth rates above 20% for network services in 1990, but three had growth rates of 12% or less.
- Both components of network services—EIS and network applications—display a wide range of growth rates, although network applications had the widest range in 1990 (from 5% to 34%) due to the expanding use of EDI in discrete manufacturing, which resulted in a growth rate of 34% in that industry in 1990.

Although the use of network services has considerable variance from industry to industry, the estimated expenditures reported to INPUT show a healthy rate of overall growth, 16%, in 1990. Only systems integration, among the other information services delivery modes, had a higher rate of growth.

In order to uncover why the use of network services is strong in certain industries or companies, it is necessary to examine the factors that encourage organizations to use network services; these factors are shown in Exhibit IV-2. INPUT obtained the information used in Exhibit IV-2 and other exhibits in this chapter from ongoing interviews with information services users. Information was also obtained from 15 recent interviews of clients of network services vendors who used on-line data bases of market prices for equities, textual information, and tables of technical data, as well as electronic mail, EDI, videotext, voice mail and VANS.

Some of the factors listed in Exhibit IV-2 refer more to one submode of network services—EIS or network applications—than to the other:

- The use of on-line information for market trading or financial evaluation relates to the use of FIS.
- Services required to support decentralization of information networks for distributors, manufacturers and financial institutions relate to network applications.

Other factors were mentioned in relation to both submodes, which were used to save time and money and to support marketing, service and other business functions:

- Clothing and food distributors and manufacturers who were interviewed emphasized that they had become impressed during the last few years with the savings in time and money that EDI could generate. The savings are now real and measurable.
- Banks, brokerage houses and other companies stated that the use of online credit, equity, technical and textual information reduced the time and cost of obtaining information from other sources.

#### **FXHIRIT V-2**

## Factors Encouraging Use of Network Services

Factor	Average Importance to Respondents
Service or information needed to support business function	Н
On-line information needed for equity and financial markets	H/M
Service or information needed for marketing and customer support	М
Network services needed to save cost and/or time	м
Clients require network services	M/L
Technological improvements stimulate use of network services	L
Network service made necessary by decentralization	L

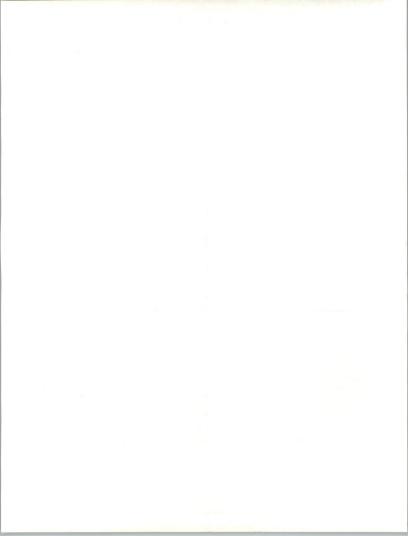
H = High

According to respondents, both submodes of network services were used to facilitate marketing and service. Clients of brokers, bankers and other companies make use of the on-line information from vendors to aid in sales and marketing. For example, a representative of a brokerage firm may access pricing data or information on stocks to help a customer evaluate an investment decision. Many companies use on-line data to approve credit decisions.

Demands that users, such as manufacturers and large retail establishments, put on their network application suppliers, combined with improvements in technology that increase line speed, have aided EDI growth.

M = Medium

L = Low



Decentralization has also led to increased requirements for electronic mail and the use of EIS from separate sites. Respondents were asked to rank their reasons for using EIS and network applications. Their responses are shown in Exhibit IV-3.

#### **EXHIBIT IV-3**

## **Primary Reasons for Use of Network Services**

Reason	Average Importance to Respondents in Reference to EIS	Average Importance to Respondents in Reference to Network Applications
Save money and/or time	M/L	Н
Improve our service	Н/М	H/M
Use for competitive advantage or to meet competition	н	L
Mandated by management	М	М

H = High

M = Medium

L = Low

Respondents feel that EIS must be used for trading in equity and financial markets to meet competitive capabilities as much as to serve the needs of users. The regional executive of a major brokerage firm said that he is very interested in the on-line services competitors may be adding that might be attractive to his customers.

Users of credit data bases feel that there is a competitive factor involved as well. They can't afford to have delays in obtaining credit, when competitors can close deals sooner because they can investigate credit worthiness more rapidly through use of their data bases.

Although users of on-line information for technical, legal or economic research feel that competitive pressure is involved, most are concerned with the savings in time and money using other alternatives to obtain information.



Users of EDI said that savings of time and money are the chief reasons for using EDI, but commented that the situations surrounding its use, and the resultant benefits, could be more complex than saving time and money suggest.

A large clothing manufacturer stated that payment by EDI was one step in a process of reducing costs and interacting more efficiently with distributors.

- The major problem in improving the process was that many distributors were used to receiving periodic shipments of goods whether they needed them or not. Using EDI, they were required to pay for these products immediately, which was undesirable.
- Procedures had to be set up to initiate orders based on current sales.

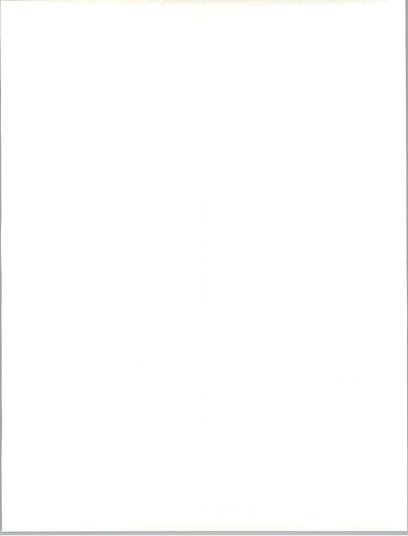
The clothing manufacturer set up techniques at some distributors for transmitting data from bar code scanners, and for pasting up sheets of bar coded sales tickets at sites that didn't have scanners, so that they could be sent by fax to the manufacturer's data center for input. Timely data on sales at each distributor has led to better planned shipments and agreement to pay more quickly through EDI.

- The manufacturer has saved money in receivables, processing and because payments have been more timely.
- The distributors have reduced inventory costs and increased sales since fast-moving items were more often available.

Another manufacturer found that while the benefits of EDI emphasize savings in cost and time and faster payment, it also found that there are savings in the entire process of supplying and monitoring the flow of goods to the market.

The respondents discussed above, as well as others who use network applications, feel that the vendors they dealt with did not fully understand the situation they were trying to improve. One respondent, who uses EDI and VANS, stated that several vendors did not analyze what he was doing. They were more interested in telling his company how to set up an EDI activity.

Users of EDI and other network applications, and EIS as well, expect vendors to work with them in a consultative manner, as shown in Exhibit IV-4.



#### **EXHIBIT IV-4**

## Network Services Characteristics Expected by Clients/Prospects

Characteristic	Average Importance to Respondents
Low incidence of problems	Н
High uptime and availability of service	Н/М
High quality: accuracy, timeliness, completeness, and presentation on screens	H/M
Prompt response and action on inquiries	м
Reasonable pricing	M/L
Planning for future needs of clients	M/L
Consultative assistance on needs	M/L

H = High

As Exhibit IV-4 also illustrates, respondents expect vendors of network services to:

- · Ensure low incidence of problems that would interrupt operations
- Provide high-quality service relating to accuracy, completeness of information, and presentation formats on screens
- · Provide prompt response and action to inquiries
- · Offer reasonable pricing
- · Plan for future needs of clients

Price does not outrank the other service characteristics clients and prospects desire.

M = Medium

L = Low

- The most critical items such, as low incidence of problems and availability of data, are more important than price in choosing among vendors, particularly for an EIS product.
- Users of network applications tend to give more weight to pricing, but users state that support services, adherence to standards, and communication capabilities still outweigh pricing in selecting vendors.

As Exhibit IV-4 indicates, clients and prospective clients of network services also expect vendors to plan for their future needs.

- This could involve research on needs for data that are not met with current products, or on alternate means of delivering information.
- Planning could also be involved with new or changing standards, new communication capabilities, or software products that support network applications.

As in all aspects of the information services industry, consulting services are a growing factor in the network services sector.

According to respondents, improvements in technology, such as those shown in Exhibit 1V-5, can stimulate the use of network services. One of the improvements of greatest interest is an expanded ability to interface to additional networks. This can expand the end points that an electronic mail or EDI system can contact, or potentially provide the means of obtaining electronic information from additional sources.

#### **EXHIBIT IV-5**

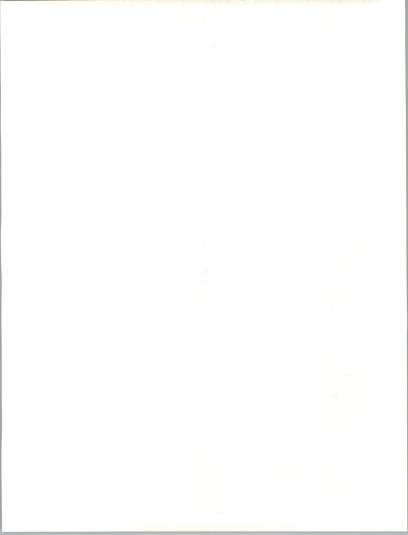
## Technological Factors Encouraging Use of Network Services

Factor	Relative Importance to Respondents
Expanded network interfaces	H/M
Expanded data inquiry/manipulation from client's PC	М
High-speed line capability	M/L
Image processing capability or plans	L

H = High

M = Medium

L = Low



The availability of higher speed line capabilities has convinced companies that it makes more sense to use electronic mail between sites or to reach customers to aid in sending information to order points or manufacturing sites. Higher speed has also led to more use of EDI.

Image processing planning is another factor reported to encourage the development of network capabilities, as shown in Exhibit IV-5. Application systems that will use image processing are now being planned and implemented in various industries.

Respondents also reported that higher speed line capabilities and image processing could be of interest in future EDI systems.

В

### User Evaluation of Network Services

There are factors that could discourage or limit the use of network services, as indicated in Exhibit IV-6. Poor service and cost rank highest, but difficulties in planning the use of network services or obtaining aid from vendors could also have an inhibiting effect.

**EXHIBIT IV-6** 

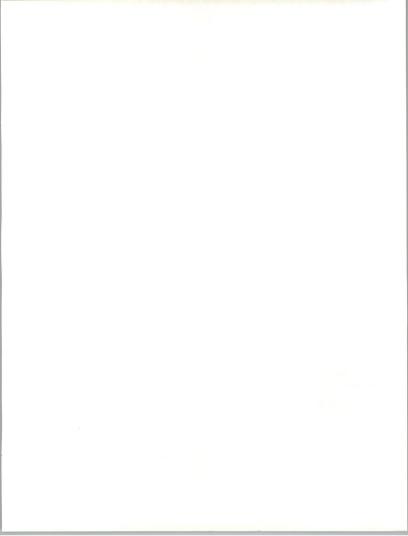
# Factors That Can Discourage Increased Use of Network Services

Factor	Relative Importance to Respondents
Poor service	Н
Cost of network services	H/M
Present systems or services with enhancements might be able to handle needs	м
Difficulty in planning use, or selecting alternatives	м
Insufficient aid from vendors	M/L
Alternatives such as CD-ROM or fax may meet needs	L

H = High

M = Medium

L = Low



Attempts to add functions to existing applications to meet network application needs, or to use alternatives such as CD-ROM for EIS data, can discourage use of network services as well.

Exhibit IV-7 indicates that alternatives to network services receive a moderate degree of attention from respondents.

- An unsystematic use of fax messages is sometimes used to meet EDI and electronic mail needs.
- CD-ROM is sometimes used in place of on-line data when data does not have to be updated frequently. Another alternative is to enhance present IS application systems or systems developed to provide a network application capability to take the place of vendors' network application products.

A large energy company noted that it had developed an alternative to EDI that would involve less communication and cost. An end user had been instrumental in devising this alternative.

#### **EXHIBIT IV-7**

### Alternatives to Network Services

Alternative	Average Importance to Respondents
Fax	H/M
CD-ROM	м
Use of enhancements to IS application systems	м
Alternate in-house systems	M/L
The use of another company's capabilities	L

H = High

One of the factors that can have an impact on the selection of an alternative to network services is the role of end users.

 As Exhibit IV-8 indicates, users are frequently involved in decisions to evaluate and purchase network services, and in their operation.

M = Medium

L = Low

 Some end users are also interested in steps that can make network services easier to use or more under the control of end users.

There is general recognition that end users must be involved in the planning and the operation of EIS, EDI, electronic mail and other network applications systems. Contacts report that problems continue to emerge in systems developed and operated for users when users are inadequately involved in the planning and implementation.

#### **EXHIBIT IV-8**

### Impact of End-Users on Network Services Selection and Operation

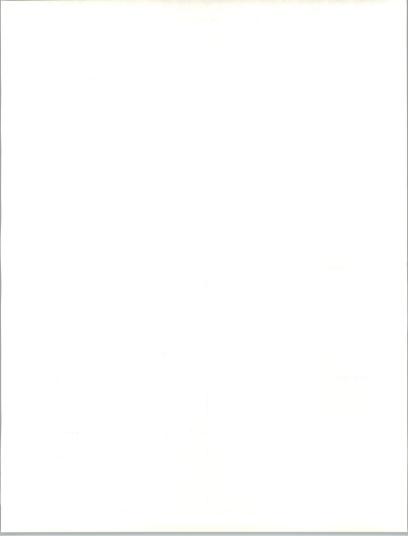
Impact	Average Likelihood Indicated by Respondents
Involved in evaluation and purchase of network services	Н
Presently use network services	H/M
Cooperation or participation of end-users required to run service	М
Advocate more control of services by end users	M/L
Other responses, including want service brought in-house or made more user friendly	M/L

H = High

The problems and complaints about network services that respondents reported in Exhibit IV-9 originated mostly from end users. The problems focus chiefly upon the difficulties that end users encounter in evaluating, selecting and using a network service; however, several other problems are also mentioned:

M = Medium

L = Low



- The problem of selecting data from multiple sources is mentioned. Means of selecting current market prices from multiple feeds have been provided to some extent through vendor products, but means of using combinations of on-line and CD-ROM data have not been fully developed.
- Means of combining vendor and in-house resources to obtain data or serve network applications is an area of interest to some users.

#### EXHIBIT IV-9

### **Problems/Complaints about Network Services**

Problem	Average Importance Reported by User
Difficult for user to specify means of obtaining data from multiple sources	H/M
Difficult for users to evaluate new services that might reduce costs or improve service	М
Difficult to evaluate and select a service	M/L
Difficult to combine resources of provider (vendor) with in-house resources	M/L
Services are not simple to use	L
Difficult to explore needs or new ideas with vendors	L

H = High

The problem that appears to be most significant to some end users is the difficulty of working with vendors. Vendors that are involved with these users may have to utilize a consultative approach and walk through the use of network applications or the use of software provided with an EIS in order to help users understand and evaluate what their network services can accomplish.

M = Medium

L = Low



The network environment, as with other elements of the information network, has become heavily influenced by the end users. Network services vendors must recognize this evolution.

C

# Future Opportunities

The improvements and changes listed in Exhibit IV-10 reflect the problems discussed above. Respondents are interested in simplified means of using EIS, means of being steered to data, and techniques for using multiple EIS or EIS and CD-ROM sources of data.

**EXHIBIT IV-10** 

### Improvements and Changes Desired in Network Services

Services Mentioned	Average Importance to Respondents
Better means of using multiple EIS products (including EIS and CD-ROM data sources)	H/M
Simplified means for users to operate EIS products	М
Products that would steer a user to sources of electronic data	M/L
Means of allowing an organization to "piggyback" network needs for EDI or electronic mail (or information access) on the capabilities of another company	L

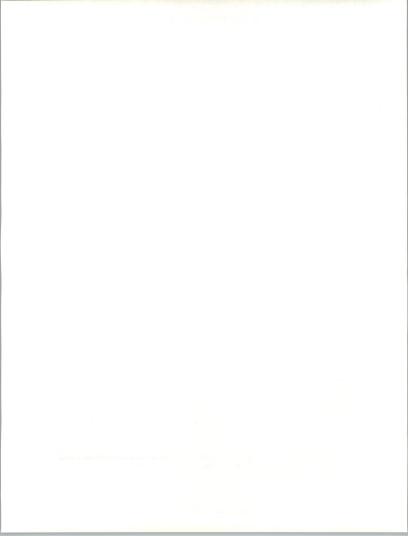
H = High

Users report that they would be interested in sharing capabilities of other companies or of vendors. As in other areas of information services, vendor alliances between network services vendors may now be required to meet user expectations and the growing preference for one-stop shopping.

One respondent also noted that an improvement his company just gained through using software that accomplishes automatic network management capabilities represented significant opportunity for growth for both vendors and users.

M = Medium

L = Low



Despite the mention of problems, and consideration of alternate means of meeting needs, respondents feel that it is very likely that the use of network services will be continued or will expand, as shown in Exhibit IV-11. Users are more inclined to have one vendor handle an increasing amount of service rather than have their own company take an expanded role in obtaining network services.

#### **EXHIBIT IV-11**

### **Future Plans of Users of Network Services**

Plan	Average Likelihood by Users of Network Services
Continue to use services	Н
Have a vendor handle an increased amount of service	H/M
Bring some functions/components in-house	M/L
Bring a large share of network services in-house	M/L
Use systems operations	L
Share the use of services with another company	L

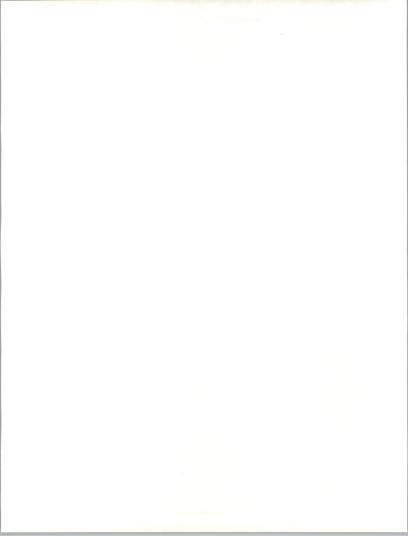
H = High

Overall, respondents expect a healthy growth for network services, as shown in Exhibit IV-12.

- The most likely level of growth expected by respondents is between 15% and 20%, both in 1991 and between 1991 and 1996; however, there is more uncertainty about growth in 1991 due to the continuing impact of the economic downturn that started in 1990.
- An evaluation of respondent estimates suggests that the expected growth for 1991 appears to be close to 16%, and that for the 1991 to 1996 period about 17%. Chapter VI will explore INPUT's forecast of growth for 1991 to 1996.

M = Medium

L = Low



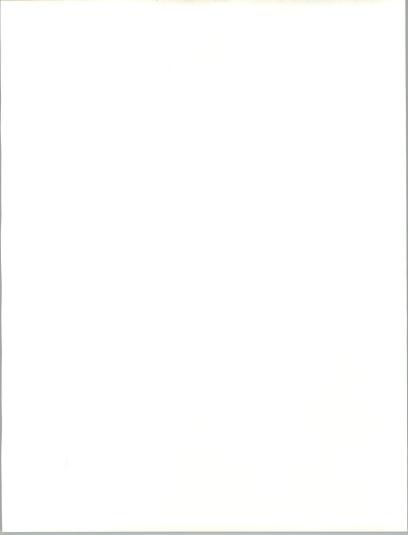
### **EXHIBIT IV-12**

## **Growth of Network Services** Foreseen by Users and Prospects

	Average Level		
	of Expectations		
Growth Rate Anticipated	1991	1991- 1996	
15% to 20%	н	н	
10% to 15%	L	L	
5% to 10%	L	-	
0% to 5%	-	-	
Drop Service	-	-	

H = High M = Medium

L = Low





# **Issues and Trends**

#### A

### Introduction

The network services mode grew so vigorously during the last few years that it seemed to be impervious to many of the factors that affected other information services modes.

- By 1991, it was apparent that vendors in the network services market were encountering problems relating to the continuing economic decline—problems similar to those suffered by vendors in other information services.
- Although the rate of growth was continuing at a high level in this mode, the increasing competition in the marketplace was having an impact on established vendors.
- The sales efforts and support required to obtain and retain business was taking more time and required more resources.

This chapter reviews the issues and trends involved in the situation discussed above, the growth of user expenditures for network services, and current pressures on vendor performance. Succeeding chapters will develop a forecast for the market and examine the performance of leading vendors of network services.

#### В

### Major Issues of Network Services Buyers

As shown in Exhibit V-1, the depressed revenues and earnings of companies is the major issue affecting buyers of network services.

 As a result, buyers have become more interested in locating competitors that can deliver similar services at reduced prices.



 Buyers are also interested in obtaining additional services and aid from network services vendors as part of buyers' present service and fee agreements. Buyers want a means of improving productivity, as well as a means of reacting to reductions in user staffs.

Buyers have also shown more concern about planning and justifying the use of network services, as noted in Exhibit V-1.

#### EXHIBIT V-1

### Network Services Major Buyer Issues

- Revenues and earnings have not recovered
- Desire for increased vendor productivity
- More concern about planning and justifying network services
- · Recognition of product/service need
- · Complexity of using EIS
- · Pressure on network planning

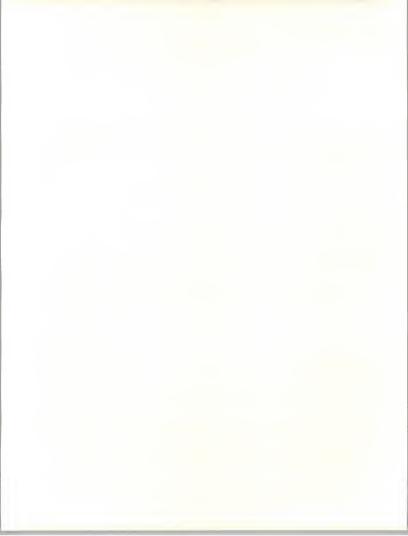
Listed in order of importance.

Many vendors have not been ready for these developments in the marketplace, and vendor earnings have suffered by having more competition and having to supply additional services.

The positive element in buyer attitudes is the recognized need for network services, as indicated in Exhibit V-1.

- In this marketplace there isn't a strong recessionary reaction that would lead to an aggregate reduction in the use of electronic information services to supply data on equity prices, credit worthiness, product information, service schedules, and other subjects, or decisions that there should be curtailed use of value-added networks, EDI, or other network applications—although the recession has caused individual firms to limit planned use.
- Buyers feel that these services are a necessary way of doing business rather than an enhancement to business activities.

Buyers point out, however, that network services can put pressure on organizations that use such services, as Exhibit V-1 shows.



- There can be complexities in the use of multiple EIS, which, according
  to a brokerage company, eventually result in requests for vendor aid. A
  manufacturer also stated that the use of a vendor's EDI services required
  more vendor aid than anticipated because each trading partner seemed to
  have additional questions.
- The use of network systems can put pressure on the present or planned use of network capabilities, according to several corporations that INPUT contacted. INPUT found needs for increased traffic and connectivity between company sites and additional connectivity with customers and suppliers even though these companies also used vendor resources.

C

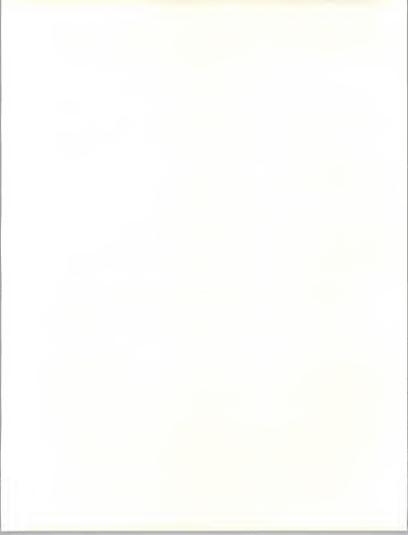
### Major Issues of Network Services Vendors

The major concern vendors expressed—the pressure on earnings from increased user demands—reflects the issues discussed in the previous section. Users are demanding increased aid in planning for and using network services and are considering the use of competitors to their current suppliers in order to obtain lower prices and commitments for increased services.

In order to reduce costs and meet user service demands, vendors report that the means of improving productivity has become a major issue.

- One major EIS vendor has brought in a seasoned higher executive from a processing vendor to review operations, staffing, work procedures, customer support, and related matters in order to cut costs and improve processing results and support for customers.
- Several other major network services vendors report that profit margins have narrowed, and these vendors have embarked on programs to reduce costs.

Planning the introduction of new technology and services has also become a major vendor issue, as Exhibit V-2 indicates. Increasing costs and narrowing profit margins have made many vendors less prone to replace older technology or expand services unless there is sufficient demand to ensure success. However, some of the firms expanding most rapidly in the network services market have done so by maintaining momentum in the introduction of services—momentum that forces prospects to pay attention.



#### EXHIBIT V-2

### Network Services Major Vendor Issues

- Pressure on vendor earnings
- · Need for improved productivity
- · Planning introduction of new technology
- Alternatives to network services
- · Cross-selling other services
- · Use of personal information

Listed in order of importance.

- GEIS has continued to introduce enhancements and new EDI products such as EPS\*EXPRESS—that have stimulated sales.
- ADP has encouraged growth of its brokerage EIS service through regular enhancement of its set of services that support the brokerage market.
- The introduction of new services by Telerate and Reuters helped fuel their growth during the 1980s.

The use of new technology can be a critical issue in the sale of network services.

- Major users of EDI have pointed out that multipoint capabilities and X.400 have been very important in users' decisions to use EDI.
- Telerate planned to increase the sale of EIS services by using the touchscreen technology jointly developed by ATT and Telerate.
- The use of new workstations and PCs in place of terminals has made it possible to develop systems that facilitate the use of EIS and network applications.

As illustrated in Exhibit V-2, however, an item of concern to vendors is whether the introduction of alternate technology or application approaches can unfavorably impact the use of network services.

According to several users, developments in the use of CD ROM technology have led to the consideration and/or use of CD ROMs for economic, technical, legal, and other information that did not require real-time updates.



 Users are also discussing the segmentation of data that users now obtain from a vendor source so that users can use an on-line data base for realtime needs and a CD ROM for more static needs.

Vendors are also concerned about the development of alternate systems to deliver payments electronically.

- One energy company reports that its internally developed system that takes advantage of newly installed network capabilities now handles payments formerly routed through a vendor's EDI service.
- Other users report that improved fax capabilities have taken the place of EDI

Major banks and other companies also report that they have developed sophisticated new networks rather than use the VANs available from vendors.

An issue of interest to some vendors is the use of network services to help sell other products.

- Telerate has used features of its EIS—such as a scoreboard of quotes to obtain business in foreign exchanges.
- GEIS has used its EDI services to gain volume in the use of its banking services.
- TRW and Dun & Bradstreet have used EIS services to help sell information delivered on paper and vice versa.

The final issue mentioned in Exhibit V-2 is not of concern to the entire network services marketplace, but some vendors delivering electronic information are concerned about the recent controversy surrounding the collection and use of personal information for consumer marketing and/or inaccuracies in credit and personal information.

- Congress may introduce legislation that would limit the ability of EIS vendors to provide credit data mixed with personal or life style data.
   Hundreds of vendors that collect and use consumer data would not be affected.
- Equifax, as a result of pressure from consumer groups, will discontinue the marketing (to direct marketers) of personal consumer information that Equifax gathered in its credit business.
- TRW and Trans Union have no plans to discontinue marketing mixed credit and personal information at this time, despite current pressures.

MANS1



#### D

### Major Trends in Network Services

During the past decade, systems integration, systems operations, and network services became recognized as separate information services. Network services had been in use for some time, however. Interactive Data and other vendors had been supplying on-line data on equity prices, products, service schedules, technical subjects, and other subjects since remote processing services became operational.

According to respondents, network services have become a part of the functions of many organizations, and respondents expect the use of these services to increase. The dependence of businesses on the use of network services can only grow, as Exhibit V-3 shows.

### **EXHIBIT V-3**

### Network Services Major Trends

- Dependence on network services
- · Global demand for EIS and network applications
- · Continual improvement of network services
- Upgrades of network technology

Listed in order of importance.

Exhibit V-3 also points out that the use of network services is expanding globally because the functions that such services serve—trading, shipping, credit checking, travel, and engineering—are being handled on a global basis. Particularly in trading situations, the availability of on-line data is essential for evaluating opportunities on a global basis.

In addition to on-line data or EIS, network applications serve banks, other financial institutions, and corporations on a global basis. Messages and payment instructions from one country to another are necessary to eliminate delays in initiating business activities or resolving problems.

The trend of greater dependence on network services and global expansion of these services has supported a corresponding trend of continual improvement of services, as Exhibit V-3 notes.

Developments in network technology in the last five years include:

 The use of new technology to increase transmission speeds and connectivity



- · Conversion of media
- · Simplification of user operations
- The use of new techniques of obtaining data or implementing network applications

 $\mathbf{E}$ 

### **Driving Forces in the Network Services Market**

One of the paramount forces driving the network services market is the constantly increasing need for electronic information, as indicated in Exhibit V-4.

#### **EXHIBIT V-4**

### Network Services Driving Forces

- · Increasing need for electronic information
- · Growing pressure to use network applications
- Improving network capabilities
- Lack of expertise in network technology and applications
- Potential revenues and savings
- · Increased interest of end users

Listed in order of importance.

- Additional information about materials, production processes, drugs in use, business activity, financial markets, and a host of other topics is constantly becoming available and producing an increase in the amount of on-line information.
- The on-line information in use can have setbacks related to the economic conditions of users, more-effective methods of using information, limitations in the auditing and control of information, and other factors—but these factors are not leading users to project reduction in the user of FIS.

On the other hand, the forces producing increased use of EDI, electronic mail, and other network applications stems more from pressures of corporations on their suppliers or customers, and/or the desire to save time and funds by moving information electronically.



Constantly improving network capabilities that make it possible to contact more end points in the U.S. and globally, as well as technology leading to faster access and transmission of data, are the major forces driving the use of EIS and network applications.

- Electronic mail and EDI can reach more company locations, clients, and suppliers.
- According to users, the increased speed of obtaining information that has
  occurred in the last few years has resulted in more opportunities to gain
  revenues or save costs.

Many users do not have sufficient ongoing research and development of network capabilities or enough technically trained staff to take advantage of increased connectivity or speed of transmission, as Exhibit V-4 notes. Major corporations indicate that it is difficult to address the range of technological change. This uncertainty is another force that drives the use of network services vendors.

Although many users talk about network services as a way of doing business, users expect that EIS and network applications will increase revenues or reduce costs, as illustrated in Exhibit V-4.

- A regional sales manager at Merrill Lynch stated that it would be impossible to handle work for clients without having on-line quotes, but he pointed out that the quality of the quotation systems that he had was partially responsible for his performance in selling.
- Several users who emphasized the convenience of using EDI for ordering and payment pointed out that cost savings were their primary motivation
- A systems planner at a large energy company has promoted the use of network services as the goal for many administrative functions, but he noted that monetary justifications were the primary driver for expanded use of these services.

End users have shown increasing interest in network services, and this interest has also been a force leading to increased use of these services.

- The energy company referred to above has made use of VANs to provide customers with on-line information that can help customers order
  products. End-user demands led to this use of VANs.
- Several companies report that users have been active in suggesting the use of additional EIS, EDI, and videotex services—and other network applications.



F

### Growth Inhibitors in the Network Services Market

As Exhibit V-5 illustrates, the inhibitor mentioned most often by users and vendors is delayed economic recovery. In some instances users reported decreased use of EIS or delayed plans for use of network applications as a result of economic conditions. Other users have reported initiating operation or expanding use of these services to stimulate business.

#### **EXHIBIT V-5**

### Network Services Growth Inhibitors

- Delayed economic recovery
- Expanded use of substitutes
- · Lack of critical network skills
- · Arrangements to share services

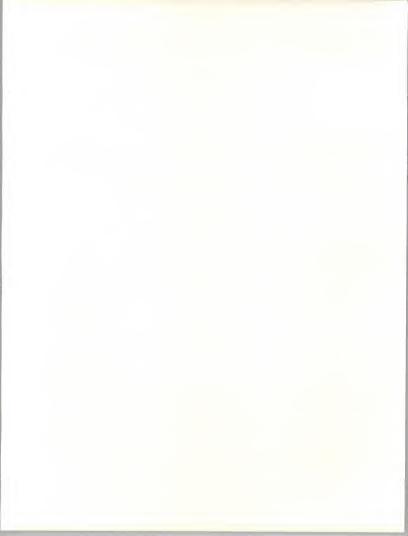
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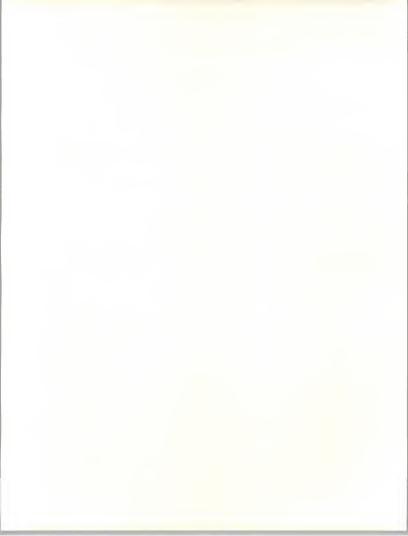
Use of alternative solutions can also inhibit use of network services. Users report that they have found vendors that supply some information on CD/ROM, which users were obtaining from EIS. Users have also found means of using fax and internal systems in place of network applications.

The lack of network skills or knowledge can be an inhibitor rather than a driving force for the use of network services, as Exhibit V-5 indicates.

- Several users report that an inability to evaluate needs and the possible use of vendor network services had created delays in initiating services.
- One user noted that improved demonstrations, easy-to-use services such as the EPS\*Express service of GEIS, or the training seminars of Sterling ORDERNET were needed as an aid to the use of EDI.

According to the comments of respondents, arrangements between users to share services such as networks or the joint development of network applications could also be an inhibitor to the growth of network services However, it is not apparent that these arrangements could result in the best use of technology for all partners or amount to a significant dollar savings on an aggregate basis.







# Market Forecast

A

### Market Overview

The network services market continues to show a favorable prospect for growth despite increased pressures on the revenues and earnings of some vendors in the marketplace. Exhibit VI-1 illustrates the continuation of favorable prospects and compares differences in the outlook of the market between 1990 and 1991.

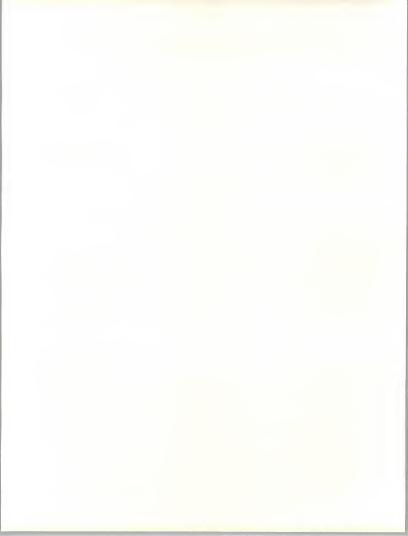
 The \$8.1 billion 1990 forecast for user expenditures was practically equal to the actual expenditures in 1990. The reconciliation in Appendix B shows a difference smaller than the scale of comparison in Exhibit VI-1.

#### **EXHIBIT VI-1**

# Network Services Market Overview (\$ Billions)

1990 Outlook		1991 Outlook
1990 Forecast - 8.1	versus	1990 Actual - 8.1
1991 Forecast - 9.4	versus	1991 Forecast - 9.4
1990-1995 Forecast Growth Rate - 17% (CAGR)	versus	1991-1996 Forecast Growth Rate - 17% (CAGR)

 The 1990 preliminary forecast for user expenditures for 1991 is also practically identical to the 1991 forecast for 1991, as illustrated in Exhibit VI-1, and the forecast for growth during the next five years remains at 17%.



### B

# **Industry Structure**

In order to analyze the performance of the information services industry, INPUT segments it into eight delivery modes that serve 15 industry sectors and seven cross-industry sectors. The delivery modes are:

- · Processing services
- · Network services
- · Turnkey systems
- · Application software products
- · Systems software products
- · Systems integration
- Professional services
- Systems operations

The network services market, which is being analyzed in this report, is broken by INPUT into two segments:

- · Electronic information services (EIS)
- Network applications

# C

### Market Structure

The structure of the network services market is related to the development of network capabilities by vendors. The first step in that process was the connection of networks to computing installations by GE and other vendors during the 1960s.

- These networks began to be used for electronic messages and payment instructions, in addition to their use for remote processing and program development.
- Providers of electronic information tended to come to the vendors of network and remote computing services from organizations that used information or became aware of the value of proprietary data bases.

As discussed above, the network services market developed historically from services involved with moving data to product-based services. The current structure of the market reflects that division of services, as shown in Exhibit VI-2.



### Network Services Market Structure

Service-Based Network Applications

- EDI
- Videotex
- Electronic mail
- · Other VAN capabilities

Product-Based

Electronic Information Services

- · On-line data bases
  - Security, fixed income, foreign exchange and other market data
  - Credit data
  - Economic, technical and other data
- On-line unstructured data
  - Bibliography, text
  - News

The services shown in Exhibit VI-2 can be further divided into those that supply financial, product, technical, or other data and those that supply unstructured information such as news.

Vendors that provide product-based services—such as TRW and Dun & Bradstreet—do not always provide network applications.

D

### Network Services Market

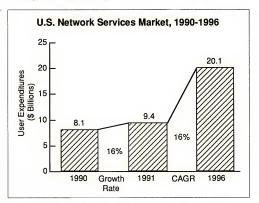
### 1. Overall Market

The market for network services is growing from a 1990 level of \$8.1 billion in user expenditures to a level of \$9.4 billion in 1991—a growth rate of 16%. User expenditures will grow at a compound annual growth rate (CAGR) of 17% during the next five years to reach \$20.1 billion in 1996.



INPUT's previous forecast was practically identical to Exhibit VI-3. The forecast rate had been lowered by 3% to reflect the impact of the economic downturn, continuing regulatory impacts, and the growing maturity of the market. It was not necessary to lower it further at this time, despite the delay in economic recovery.

**EXHIBIT VI-3** 

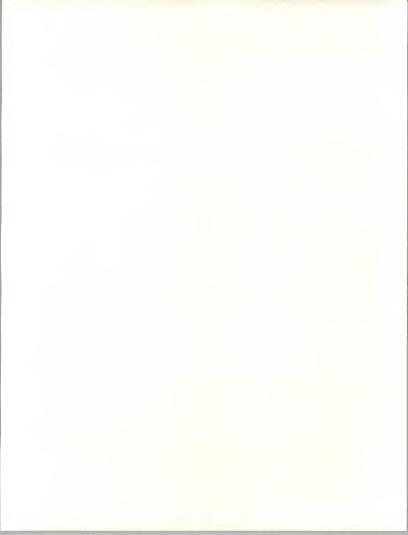


The continuing growth in network services is due to the fact that growth can assist in revenue generation or cost reduction while creating a more automated way of conducting business.

- Network applications provide electronic rather than paper means of handling business with customers, suppliers, service companies, and government offices—as well as with other offices in an organization. Instructions, messages, data, and payments can be handled more quickly and save time and costs.
- Information necessary to make decisions, conduct research, aid clients, or keep processes functioning can be sought and accessed more rapidly and on an automated basis.

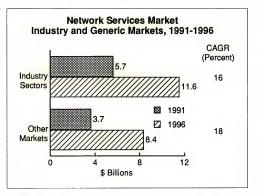
### 2. User Expenditures by Industry and Generic Sectors

The user expenditures of \$9.4 billion for network services in 1991 can be divided among industry and generic markets, as shown in Exhibit VI-4. By generic, INPUT means use can be made of this service in such a broad or general way across industries or in applications that it is impossible to



divide the use by cross-industry or industry categories. Network services have certain EIS offerings—such as on-line data bases of securities, credit, and economic data—that qualify as generic markets.

### EXHIBIT VI-4



61% of the network services market is in industry markets at the present time, but the percentage will shrink to 57% by 1996.

The differences in use of network services between industry markets is pronounced, as shown in Exhibit VI-5.

- In 1991, three industries show user expenditures of under \$100 million, one has expenditures of over \$1 billion, and others are divided above and below \$300 million.
- In 1996, one still has an expenditure level of below \$100 million and four have expenditures of above \$1 billion.

The wide range of results by industries indicates that vendors should be selective about the markets to which they offer network services.

Vendors that offer information services products in industry markets such as process manufacturing, banking and finance, and business services—but do not offer network services in those markets should definitely explore opportunities for offering those services.

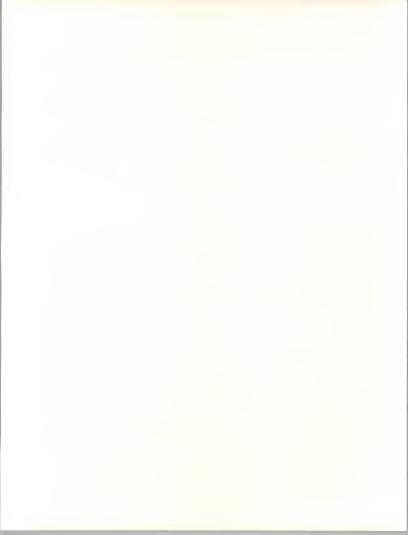


### Network Services Market User Expenditures by Industry, 1991-1996

	User Expenditures \$ Millions		1991-1996 CAGR
Industry Sector	1991	1996	Percent
Discrete Manufacturing	86	268	25
Process Manufacturing	825	1,920	18
Transportation	300	686	18
Utilities	28	43	9
Telecommunications	110	258	19
Wholesale Distribution	275	777	23
Retail Distribution	187	507	22
Banking and Finance	850	1,710	15
Insurance	228	402	12
Medical	504	1,126	17
Education	191	419	17
Business Services	592	1,201	15
Federal Government	1,234	1,825	8
State and Local Government	92	248	22
Miscellaneous Industries	125	245	14
Industry-Specific Total	5,627	11,635	16
Other	3,723	8,417	18
Total Network Services	9,350	20,052	16

Vendors in other industries should be more selective in considering this delivery mode.

The federal government is the largest user of network services—the federal government made expenditures of \$1.2 billion in 1990, based mainly on the use of network applications to meet the needs of civilian and defense agencies.



- The federal government is presently the largest user of network applications and ranks fourth in the use of EIS.
- The growth rate for federal government use of network services is down to a CAGR of 10% as a result of pressure to reduce federal expenditures as a whole. There are also questions about possible federal workload changes that could be brought about by future use of the FTS 2000 network

The markets that follow the federal government in expenditures for network services, banking and finance, process manufacturing, and business services have more expenditures for EIS than does the federal government, but the other markets spend less on network applications.

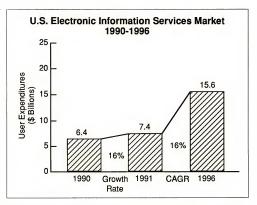
- One of these three markets, process manufacturing, has a CAGR of 18%, which is above the growth figure for network services as a whole between 1991 and 1996. The other two are growing at a CAGR of 15%, which is below the average of 17% for network services.
- The industry markets with the highest growth rates for the use of network services—discrete manufacturing, telecommunications, and state and local government—are substantially below leading industries in the absolute amount of network services being used. These three markets will all have less than \$300 million in user expenditures in 1996.

Expenditures in generic markets will grow more rapidly than in industry markets over the next five years, as shown in Exhibit VI-5. This more-rapid growth is due to the fact that the market for generic services is composed of a subset of EIS that includes equity pricing, other financial information, and on-line news services that are entering and growing in a number of submodes and niches in retail distribution simultaneously.

#### 3. Electronic Information Services (EIS) Market

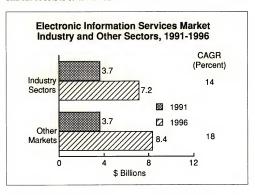
Exhibit VI-6 shows that user expenditures for EIS will grow at a rate of 16% in 1991 to \$7.4 billion and rise at a CAGR of 16% between 1991 and 1996—to a level of \$15.6 billion in 1996.





Expenditures for EIS are divided into industry and generic components in Exhibit VI-7. The expenditures for each will be nearly equal in 1991, but the expenditures for generic markets are growing at a faster rate since vendors selling access to generic data for one market usually find that the data can be sold to other markets.

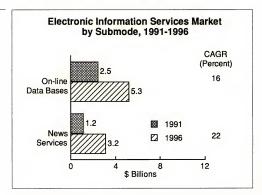
**EXHIBIT VI-7** 





The type of information delivered through EIS is divided into two main types in Exhibit VI-8: on-line data bases and news services.

### EXHIBIT VI-8



- Expenditures for on-line data bases are more than twice as large, at \$2.5 million, as expenditures for news services.
- Expenditures for news services are growing at a CAGR of 22%—almost 25% larger than the rate for on-line data bases because they can be utilized in a much wider range of industries and activities.

The use of EIS is driven in general by improvements in the use of communications and computing technology that can result in lowered user costs, more timely data, and improved means of accessing and utilizing data.

Improvements can also include easier means of accessing data through new terminal or PC features, voice messaging, or graphical interfaces. These developments and improvements are needed to cope with the expanding amount of information available

Developments in PC software have added to the ability to use EIS by facilitating access to multiple data bases and by accessing data on preset schedules—as well as by manipulating and combining data with the use of spreadsheet, data base, statistical, graphics, and other programs.

As shown in Exhibit VI-9, the leading industries in the use of EIS are banking and finance, process manufacturing, and business services.



# Electronic Information Services Market User Expenditures by Industry, 1991-1996

	User Expenditures \$ Millions		1991-1996 CAGR
Industry Sector	1991	1996	Percent
Discrete Manufacturing	43	114	21
Process Manufacturing	708	1,400	15
Transportation	226	486	17
Utilities	25	37	8
Telecommunications	90	204	18
Wholesale Distribution	63	118	13
Retail Distribution	125	286	18
Banking and Finance	750	1,500	15
Insurance	171	317	13
Medical	304	556	13
Education	120	269	18
Business Services	575	1,154	15
Federal Government	334	440	6
State and Local Government	44	90	15
Miscellaneous Industries	118	227	14
Industry-Specific Total	3,696	7,198	14
Cross-Industry	3,723	8,417	18
Total EIS	7,419	15,615	16

- Expenditures in the banking and finance industry are driven by the use
  of on-line data bases to supply pricing and other financial and economic
  information to price or evaluate equities, portfolios, collateral, alternate
  courses of action, or other business situations.
- Expenditures in business services are driven by the use of on-line data bases of financial, legal, and other business data to help in preparing analyses, reports, or other products or services.

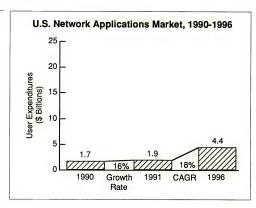


Process manufacturing includes a number of industries—such as chemicals, pharmaceuticals, and petroleum—that are heavy users of on-line technical information used in manufacturing, storing, shipping, pricing, and a variety of other purposes.

### 4. Network Applications Market

User expenditures in the network applications market are growing at a rate of 16%—from \$1.7 billion in 1990 to \$1.9 billion in 1991, as shown in Exhibit VI-10. Growth will continue at a CAGR of 18% to a level of \$4.4 billion in 1996.

**EXHIBIT VI-10** 



- Network applications amounted to about one-fifth of network services expenditures in 1990 and will include about 1% more of these expenditures by 1991.
- Network applications are driven by needs or demands of clients and by developments in communications, just as the use of EIS is. However, network applications also save postage, office labor, and other costs thereby encouraging the use of electronic payment and mail versus paper-based media.

Developments that improve network quality and service capabilities—such as internetworking—promote the use of EDI, electronic mail, videotex, and other network applications.



In addition to reducing costs, saving time, and promoting business, network applications provide means of improving work and organizing better communication with suppliers and customers.

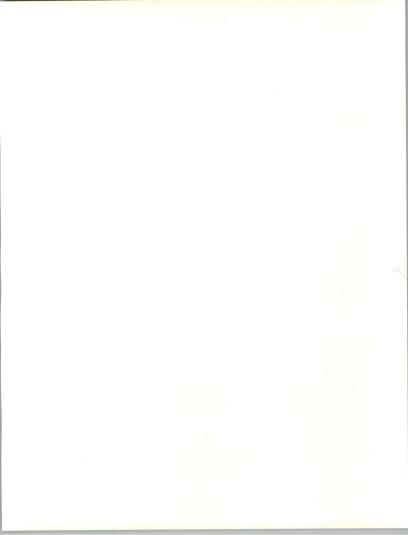
Exhibit VI-11 shows the expenditures for network applications by industry markets.

#### **EXHIBIT VI-11**

# Network Applications Market User Expenditures by Industry, 1991-1996

	User Expenditures \$ Millions		1991-1996 CAGR
Industry Sector	1991	1996	Percent
Discrete Manufacturing	43	154	29
Process Manufacturing	117	520	35
Transportation	74	200	22
Utilities	3	6	14
Telecommunications	20	54	22
Wholesale Distribution	212	659	25
Retail Distribution	62	221	29
Banking and Finance	100	210	16
Insurance	57	85	8
Medical	200	570	23
Education	71	150	16
Business Services	17	47	22
Federal Government	900	1,385	9
State and Local Government	48	158	27
Miscellaneous Industries	7	18	21
Industry-Specific Total	1,931	4,437	18
Generic	NA	NA	NA
Total Network Services	1,931	4,437	18

The expenditures in the federal market are about five times larger than in any other market. The explanation is heavy use of network applications: EDI, VANs, and electronic mail.



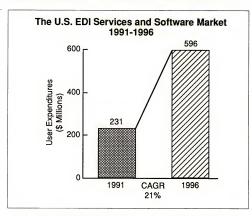
 Expenditures in some industries—such as utilities, telecommunications, and miscellaneous industries—are very small.

A group of industries—including discrete and process manufacturing, wholesale and retail distribution, and state and local government—have high growth rates. These growth rates reflect increased use of EDI in most cases.

### 5. EDI Market

Due to interest in the EDI component of the network services, INPUT provides a separate analysis of this market. The expenditures for network services and software to serve this market are shown in Exhibit VI-12.

**EXHIBIT VI-12** 



- The market illustrated in Exhibit VI-12 is projected to grow at a compound annual growth rate of 21% from 1991 to 1996. Expenditures will increase from \$231 million to \$596 million.
- The forecast growth rate of 21% has risen from the rate of 19% previously forecast for 1990-1995, and INPUT forecasts expenditures for the mid-1990s to be 75% higher than what INPUT previously estimated.

Despite the current increase in growth, INPUT feels that growth will start to level off later in the decade.

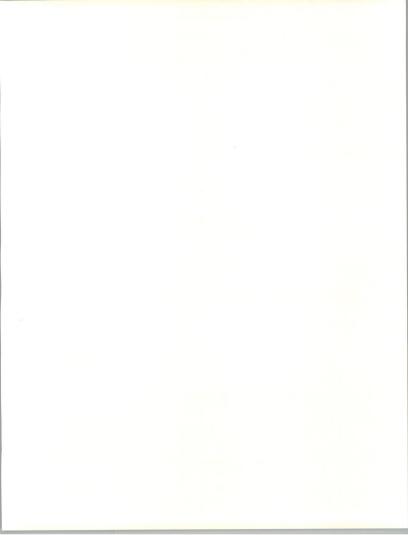
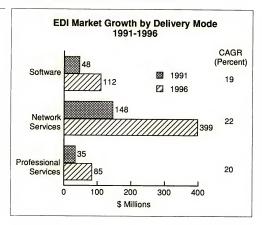
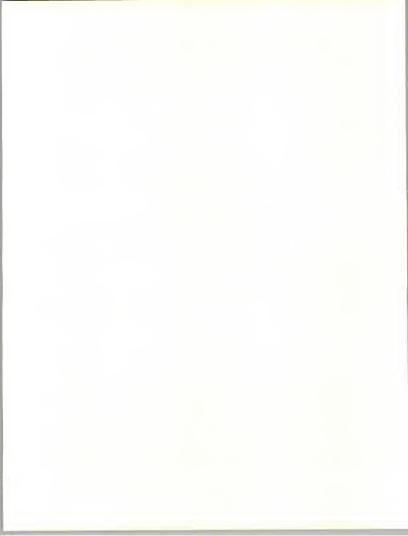


Exhibit VI-13 shows the growth by delivery mode for EDI. The rates of growth for the three modes shown are relatively similar. However, the greatest absolute growth in expenditures is for network services, which will benefit from the spurt in EDI growth encouraged by recent interest in reducing costs and speeding up business interaction.

**EXHIBIT VI-13** 







# Competition

#### A

### Introduction

Vendors competing in the network services market and segments thereof are discussed in this chapter, together with information about fast-growing services and characteristics of vendors in the market. The two segments or submodes of the market that this chapter discusses are:

- Electronic information services (EIS) that involve data bases of electronic data that can be accessed but not changed by users who wish to satisfy information needs.
- Network applications or electronic communication—including EDI, electronic mail, videotex, and VANs.

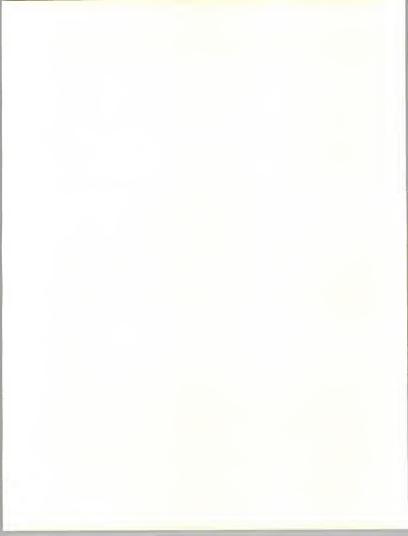
#### B

### Market

#### 1. Market Leaders

The list of top vendors of network services in Exhibit VII-1 illustrates that competitors in this marketplace come from a variety of industries.

- The competitors include publishers of financial information—such as Dow Jones and Dun & Bradstreet; book publishers such as McGraw-Hill; a bank, Citicorp; the leading computer manufacturer, IBM; a newspaper holding company; two subsidiaries of manufacturers of noncomputing products; and vendors of information industry services.
- Information services vendors that offer network services tend to be known chiefly for services in other delivery modes such as ADP and CSC.



# Leading Vendors of Network Services in 1990

Rank	Vendor	Estimated Revenue (\$ Millions)	Market Share (Percent)
1	TRW (including Chilton)	700	9
2	Dow Jones (Telerate)	425	5
3	Dun & Bradstreet	415	5
4	Mead Data Central	410	5
5	Equifax	390	5
6	Reuters	372	5
7	McGraw-Hill	325	4
8	BT Tymnet	220	3
9	ADP	215	3
10	Sprint	214	3
11	Citicorp (Quotron)	195	2
12	Knight-Ridder (& Dialog)	172	2
13	GEIS	148	2
14	CompuServe	146	2
15	IBM	145	2

Exhibit VII-1 illustrates that the market is dominated by a group of large vendors.

- The top ten vendors in this exhibit account for 45% of the 1990 revenue for network services.
- · The next five vendors add 10% more to the total revenue.

In addition to the large vendors, there are vendors in the middle of the market from a revenue standpoint—such as Policy Management Systems, which has about \$70 million in revenues, and a large number of vendors with limited revenues.

The leading firms in the market provide EIS, on-line data bases of information for credit, investment analysis, and equity pricing. Exhibit VII-2 shows the product focus of these firms.



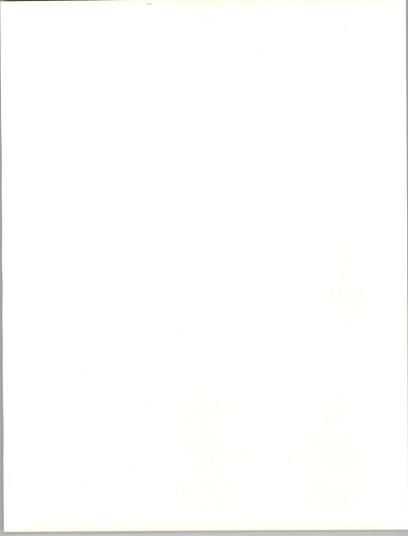
### Product/Service Focus of Leading Network Services Vendors

Rank	Vendor	Product Focus
1	TRW	Credit data
2	Dow Jones (Telerate)	Financial market prices and news
3	Dun & Bradstreet	Financial and other corporate data
4	Mead Data Central	Legal and news texts
5	Equifax	Credit data
6	Reuters	Current financial market news and prices
7	McGraw-Hill	Econometric and other industrial data
8	BT Tymnet	EDI and other network applications
9	ADP	Current security and commodity prices
10	Sprint	Network applications for multiple purposes
11	Citicorp (Quotron)	Current security and commodity prices
12	Knight-Ridder (Dialog)	News and bibliographic, financial data/prices
13	GEIS	EDI, VANs, other network services
14	CompuServe	EIS and network applications
15	IBM	Financial and other network services

- More than half of the top 15 vendors in Exhibit VI-1 have products that focus on financial users. The most common focus is credit or security pricing.
- The vendor with the largest revenues from network services, TRW, is devoted chiefly to credit functions. The second largest firm in this market, Dow Jones, concentrates on equity pricing and related financial information.

In addition to the product uses in Exhibit VII-2, there are a large number of other on-line data base products (EIS) that provide information on chemicals, agriculture, construction materials, audience ratings, and other subjects.

There were not as many acquisitions in the network services market last year, as opposed to previous years. Dow Jones gained its market rank through the acquisition of Telerate. TRW gained market volume by



purchasing Chilton. British Telecom acquired network services and other business from McDonnell Douglas in 1989.

Many alliances have taken place. A notable arrangement allowed CSC credit data to be accessed through Equifax. TRW has worked with ISO to obtain additional data for credit-checking purposes.

### 2. Market Segments

The largest segment or submode of network services is EIS.

- EIS provides almost 80% of the revenue for the network services delivery mode.
- Eight of the top ten vendors of EIS in Exhibit VII-3 are among the 10 leading vendors in the overall network services market.

Exhibit VII-3 shows a distinct drop-off in the revenues of EIS vendors. Volume drops almost by an order of magnitude between the first and eleventh vendors.

### **EXHIBIT VII-3**

### Leading Vendors of Electronic Information Services in 1990

Services III 1990			
Rank	Vendor	Estimated Revenue (\$ Millions)	Market Share (Percent)
1	TRW (including Chilton)	700	11
2	Dow Jones (Telerate)	425	7
3	Dun & Bradstreet	415	6
4	Mead Data Central	410	6
5	Equifax	390	6
6	Reuters	372	6
7	McGraw-Hill	325	5
8	Citicorp (Quotron)	195	3
9	Knight-Ridder (& Dialog)	172	2
10	ADP	154	2
11	CSC	75	1
12	CompuServe	70	1
13	PMS	69	1



- The largest vendors tend to be those that devoted themselves to the development of comprehensive EIS that can be sold apart from other services.
- Many vendors with lower volumes of revenue from EIS—such as Policy Management and Triad—are concerned with the sale of EIS and other products in markets that these vendors serve, or are concerned about a service concept that includes EIS—such as CompuServe.

As shown in Exhibit VII-4, most of the larger EIS vendors offer on-line credit information or security prices, but not both. Three of the top ten companies in the exhibit offer credit information, six offer pricing data, and one—Mead Data Central—offers neither credit nor pricing data.

### EXHIBIT VII-4

## Leading On-Line Data Base Vendor Market Focus

Company	Credit Information	Securities Prices	Vertical Specialty	Business Information
Dun & Bradstreet	Х	-	-	Х
Equifax	х	-	х	-
TRW	x	-	-	-
Reuters	-	х	-	-
ADP	-	х	-	-
Citicorp (Quotron)	-	х	-	-
McGraw-Hill	-	х	х	х
Dow Jones (Telerate)	-	х	-	х
Mead Data Central	-	-	х	-
Computer Sciences Corp.	х	-	-	-
CompuServe	-	-	-	Х
Knight-Ridder (Dialog)	-	х	-	Х



A number of information providers now supply paper-based products or processing services that could expand into EIS in the future.

- IRI and other vendors that capture sales data, organize it into data bases, and prepare reports and sets of information about buying patterns use disks, paper, or other media to deliver this information to clients. Some of these vendors have been considering plans to make more information available to clients through on-line data bases.
- Some of the telemarketing and TV buying services—such as Information Resources—that utilize data bases in their internal work have been considering means of allowing clients to access data on-line.
- Services that have used data bases of printing templates, overlays, or text to aid in the processing necessary to create catalogs or directories have mentioned services that would allow clients to use terminals or PCs to access information for in-house work

Exhibit VII-5 shows differences between the network services, EIS, and network applications submodes. There are not only a greater number of large vendors devoted to EIS, but also more small vendors devoted to EIS than to network applications. The explanation is that many sets of business, technical, and other data are available from specialized groups.

Exhibit VI-5 also points out that expenditures for network applications are substantially smaller—about 25% of expenditures for EIS.

A comparison of the list of leading vendors of network applications in Exhibit VII-6 with the list of vendors in Exhibit VII-3 shows that there are fewer vendors obtaining high levels of revenue from network applications than from EIS.

Because revenues from network applications are growing at a faster rate as discussed in chapter VI—and because improvements in network technology aid both segments of network services, there could be arguments for offering both submodes of network services.

- However, four out of the top five vendors of network applications in Exhibit VII-6 do not offer EIS as well as network applications. Nine of the top ten vendors of EIS in Exhibit VII-3 do not offer network applications.
- The submodes of network services do not tend to cross-sell each other and may not have business characteristics that would make it sensible to combine submodes.



### EXHIBIT VII-5

## Comparison of Electronic Information Services and Network Application Vendors

Characteristic	EIS	Network Application		
Largest Vendors	Publishers. Subsidiaries of large companies interested in revenue potential of EIS	Communication vendors. IS vendors exploiting network capabilities		
Midsized and Smaller Vendors	Chiefly companies who offer EIS products related to their businesses. There are many small vendors.	IS vendors and users gaining revenue from their investments in network applications. Few small vendors.		
Other Vendors	More than half of large vendors and a higher percentage of smaller specialize in EIS.	Larger venders offer multiple information services. A number of EDI providers also market EDI software.		
Revenue of Vendors	There are ten vendors earning over \$200 million.	Five vendors earn over \$100 million.		

### **EXHIBIT VII-6**

## Leading Vendors of Network Applications in 1990

Rank	Vendor	Estimated Revenue (\$ Millions)	Market Share (Percent)
1	BT Tymnet	220	13
2	Sprint	214	13
3	IBM	145	9
4	GEIS	140	8
5	мсі	105	6
6	CompuServe	76	5
7	ADP	61	4
8	csc	53	3



As Exhibit VII-5 noted, the leading vendors of network applications tend to be companies—such as BT Tymnet, MCI, and GEIS—that have sizable investments in network capabilities and can take advantage of these capabilities in the network applications market.

Other vendors in the network applications market have a high level of interest in specific products, particularly EDI.

- Sterling Software is an exponent of EDI that has invested in software products and network capabilities based on an evaluation of the future potential of the EDI market.
- Users of EDI—such as Sears—have also become vendors of this service since they have established capabilities to meet their own EDI needs and feel they can take advantage of the growing need for these capabilities.

### C

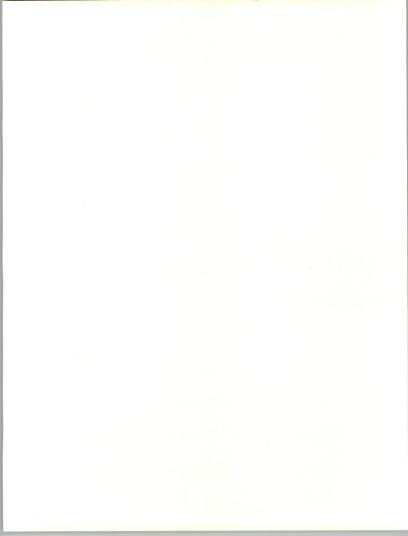
## Vendor Profiles

Information about the vendors in Exhibit VII-7 is presented in this section to aid in the analysis of the network services market.

## **EXHIBIT VII-7**

## Vendors Profiled in This Report

- BT Tymnet
- CompuServe
- Equifax
- RAILINC
- Sterling
- Triad
- Included are selected details about the network services offered by vendors, the other information services offered, vendor strategies, and company background.
- Additional information about these vendors and other vendors active in the network services market are in reports published by INPUT's Vendor Analysis Program.



# 1. BT Tymnet, Inc. 2560 North First St., San Jose, CA 95131 408-922-0250

#### a. Company Strategy

BT Tymnet aims to be one of the world's largest providers of a wide range of shared, dedicated, and hybrid network solutions. The company operates the TYMNET public packet data communications network and provides access to dial-up services, major on-line data bases, EDI services, card authorization/electronic data capture, and other services in support of the BT Tymnet strategy.

#### b. Company Background

In 1969 the TYMNET data network began providing remote-processing services to timesharing clients. In 1977, TYMNET became an FCC-regulated specialized common carrier. McDonnell Douglas acquired the service in 1984. In 1989, British Telecom ple acquired TYMNET and a value-added service provider active in Japan. These acquisitions, together with Dialcom, which BT acquired in 1986, were reorganized as BT Tymnet, a subsidiary of British Telecom, in 1989.

#### c. Products and Services

The TYMNET network consists of intelligent communications processors and network capabilities that allow clients to communicate between attended or unattended terminals and their own or other computers in a variety of locations. A number of different protocols, error correction, protocol conversion, data security, and other services are provided by the network. Access to major on-line data bases is also provided through this network.

EDI\*Net is the principal EDI service of BT Tymnet and provides thirdparty value-added communications services for automated exchange of business documents—such as purchase orders, invoices, and bills of lading. There are over 1000 clients—mostly in the transportation, grocery, electronics, telecommunications, aerospace, oil, and warehousing industries.

Credit card and electronic data capture are provided for all major credit cards as well as private-label programs.

Private and hybrid data networks are also provided to clients in a number of industries.



# 2. CompuServe, Inc., 5000 Arlington Centre Blvd., Columbus, Ohio 43220, 614-457-8600

#### a. Company Strategy

CompuServe concentrates on offering on-line and other services to individual personal computer owners. These services will support CompuServe's position as the largest on-line provider. About 548,000 members around the world use CompuServe services. CompuServe revenues derive from network services, software products, and communication and information-processing services.

CompuServe leverages the use of its capabilities to gain revenue from electronic mail, transaction processing, software products, and value-added networks for about 2,000 major U.S. corporations and government agencies.

#### b. Company Background

CompuServe was founded in 1969 to provide network-based services to users of computing systems. CompuServe has grown through expansion of its services, as well as from the acquisition of vendors of network services, software products, and network capabilities. One important acquisition was the Source from Readers Digest. The Source provided online information to a variety of clients.

CompuServe has operated as a wholly owned subsidiary of H.R. Block since Block acquired CompuServe in 1980.

#### c. Products and Services

Through the Information Services Division, CompuServe provides access to a range of data bases that cover business, research, demographics, and news as well as access to electronic mail, interactive conferencing, home shopping, financial transaction, and travel planning services for individual users of microcomputers.

Through the Business Services Division, corporate and government users have access to application software products, financial data bases, communication services, and network services—including electronic mail, EDI, videotex, and VANs.

The Software Products Division provides data base management and spreadsheet modeling software products and industry-specific software products for the financial, human-resources, and newspaper management fields.



The Support Services Division provides systems engineering, product development, operational services, and general support to the foregoing three fields.

# 3. Equifax, Inc., 1600 Peachtree St., N.W. Atlanta, GA 30309, 404-885-8000

#### a. Company Strategy

Equifax provides a range of services for credit reporting—including information that can be obtained electronically for consumer and commercial services credit reporting and insurance underwriting. These services can entail the use of processing and network services. In addition, Equifax uses its resources to provide a set of related marketing services to customers.

With the acquisition of Telecredit at the end of 1990, Equifax found itself with a new set of products and strategies related to the check guaranty and credit card businesses. Telecredit's experience with low-cost processing centers was also of value to Equifax since its margins were narrow.

#### b. Company Background

Equifax began in 1899 as a credit-reporting agency and grew into a company that provided credit reporting, insurance underwriting, and product marketing. The company took its present name, Equifax, in 1976. Equifax has been expanding its operations through the acquisition of companies in the U.S., Canada, and Europe. Equifax Europe, with head-quarters in the U.K., supports the company's products outside North America. Service in England expanded through the acquisition of Next plc in 1990—the result is the provision of consumer credit-reporting, credit-scoring, marketing, and other services throughout the U.K.

#### c. Products and Services

Credit Information Services, one of Equifax's business units, is a national credit bureau that provides information for consumer and commercial credit reports, services for the management and collection of accounts receivable, and the detection and prevention of fraud.

The Insurance and Special Services business unit provides risk management, automated claims information exchange, motor vehicle reports, and electronic information on rate and price to the property and casualty industry.

The Marketing Services Unit provides market research, market data analysis, statistical modeling, and target marketing information to clients—direct marketing firms, manufacturers, and advertising agencies.



# 4. RAILINC Corporation, 50 F St. N.W., Washington, D.C. 20001

#### a. Company Strategy

RAILINC is attempting to meet network services and related needs for segments of the transportation industry and for companies that interact with these segments. About 80% of RAILINC revenue was from network services and 20% was from software products.

RAILINC's software products support and expand network service offerings to meet the needs of transportation companies and users.

In addition to the railway industry, RAILINC serves ocean and motor carriers—and manufacturers and distributors that use transportation services.

#### b. Company Background

RAILINC was founded in 1982 and is a subsidiary of the Association of American Railroads. About \$8 million of the \$15.3 million 1990 revenues came from members of this association.

#### c. Products and Services

Network applications include:

- The CLM Collection Service, which electronically collects Car Location Messages from most rail carriers and provides shippers with a single source of CLM information
- The Data Exchange System, which consolidates car hire and repair bills from over 95 railroads and supplies the bills to rail car owners in computer-processable form. Over 90% of this type of information is handled by RAILINC.
- EDI traffic among over 300 clients—including rail carriers, manufacturers, ocean carriers, and trucking companies.

On-line data base services offered by RAILINC include:

- Information on freight car, trailer, and container movement across the U.S., Canada, and Mexico. This information is used for car hire calculations by over 100 subscribers.
- A computerized version of the Official Railroad Equipment Register, which contains information on the physical characteristics of more than 3 million registered freight cars, trailers, and containers.



Other services include a rail car tracing and pool management system and microcomputer software that:

- · Traces rail shipments and also makes use of CLM data from RAILINC
- Automates car repair billing, which makes use of data from RAILINC data bases
- Provides for data entry and transmission of data by using EDI and other standards, and for access to RAILINC data bases.
- 5. Sterling Software, Inc., EDI Group 4600 Lakehurst Court, P.O. Box 7160, Dublin, OH 43017, 614-793-7000

#### a. Company Strategy

Sterling's EDI Group has developed and acquired a comprehensive set of EDI services and related software and services that have established the company as a major competitor and source of expertise in EDI.

As part of Sterling strategy, the EDI Group focuses on maintaining a close relationship with clients and supplying client needs as use of EDI expands. This strategy is supported with education and by encouraging the most extensive user group activity in the EDI market.

## b. Company History

The EDI Group was created in October, 1990 and includes the ORDERNET Services Division, the EDI Labs Division, and an EDI International Division, which has headquarters in London. The REDINET Services Division of CDC was acquired in 1991 and folded into the ORDERNET Division. Fiscal 1990 revenues were over \$23 million; 85% of revenues came from the U.S.

#### c. Products and Services

About 55% of the EDI Group's revenue comes from software products and 45% from network services. Both software products and network services are offered though the ORDERNET division to over 2,700 customers in the pharmaceutical, grocery, hardware and housewares, retail, medical distribution, mass-merchandising, warehousing, transportation, and automotive industries.

ORDERNET provides an on-line network to manage and control the flow of standardized business documents among over 2,000 trading partners.



Services to certain industries are provided through vendors active in those industries. ORDERNET services are made available to hospitals through GTE Health Systems. Services include a data base on drug usage and are made available to the medical industry through International Health Applications. Internetwork traffic for the grocery industry is supported through BT Tymnet.

Electronic transmission of chargeback information between wholesalers and pharmaceutical manufacturers is provided in three formats established by national druggists' associations.

Software from the EDI Group provides translation between established standards for EDI and other standards, and between a variety of record formats—as well as support of existing protocols on different hardware platforms.

A data base service is also available to build on EDI documents, including purchase orders and invoices.

Security services, education, and software maintenance are also offered in support of EDI products and services.

#### Triad Systems Corporation, 3055 Triad Drive, Livermore, CA 94550, 415-449-0606

### a. Company Strategy

Triad is principally concerned with providing information services that will ensure a strong and ongoing relationship and recurring revenues from selected industries—including retail and wholesale segments of the automotive aftermarket, retail hardgoods firms, and dentists.

Services for the automotive aftermarket have been expanded to include turnkey systems that will address the processing and communication needs of a wide range of retail and wholesale establishments—in addition to software products and maintenance services. Triad's strategy of obtaining recurring revenue led to the provision of electronic information services that supply automotive parts pricing and catalog updates.

## b. Company Background

Triad was formed in 1972 to offer turnkey systems to selected markets. The company has also engaged in leasing and third-party maintenance services.

Triad had about 10,700 customers worldwide at the end of 1990.



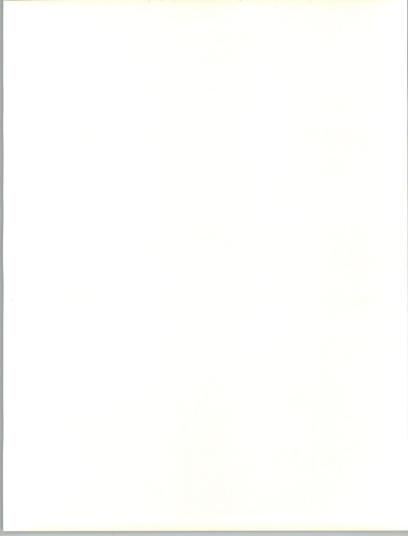
Over 85% of Triad's revenues derive from turnkey systems and associated maintenance and support functions; 9% derive from EIS; and the remainder derive from leasing. The EIS services were the fastest growing component of Triad in 1990—a growth rate of 29%.

#### c. Products and Services

The Automotive Division of Triad markets turnkey systems with inventory, billing, and accounting functions to distributors, jobbers, retailers, and auto repair shops in the automotive aftermarket. The information Services Division provides two proprietary data bases for automotive parts pricing and catalog updating to the same automotive aftermarket clients.

The Hardgoods Division provides turnkey systems to hardware stores, home centers, lumber/building materials dealers, and decorating retailers. The Dental Division provides turnkey systems to dental practices.

The Customer Services Division provides predelivery and installation services, customer training, hardware maintenance, software support, and third-party maintenance. Triad also has a leasing subsidiary.







## Conclusions and Recommendations

A

#### Conclusions

As indicated in Exhibit VIII-1, one conclusion about the network services market is that the recession has had an impact on business in some industries but not in others.

#### **EXHIBIT VIII-1**

#### Conclusions

- · Impact of the recession varies by industry
- · Interaction of technology and business impact EIS
- · Positive effect of network technology
- · Healthy growth in market
- · Narrow range of vendor markets and services
- · Cost levels of some vendors are high
- Increasing use of EDI/electronic commerce
- The current and projected use of network services in the banking and finance market is down significantly (by almost 36% by 1996) from prior forecasts, reflecting the impact of the recession in this market and the consolidation and limited budgets that have resulted. The drop in growth is most severe for the use of EIS.
- The projected use of network services in telecommunications and state and local government has also shrunk due to the impact of the recession on budgets.



- In distribution and manufacturing, the impact of the recession was more than offset by the need to use network services to improve productivity.
- · Other industry markets showed little or no change from prior forecasts.

The differences in the impact of the recession illustrate the fact that the use of network services is very sensitive to the industry involved. There are large differences in the volume of user expenditures by industry. Five industries will have expenditures of over \$1 billion by 1996, while five others will have expenditures of under \$300 million.

The interaction of technology and business has a noticeable impact on network services, as noted in Exhibit VIII-1:

- The use of CD ROM technology is having an impact on the electronic information services (EIS) submode, particularly in banking and finance.
- Information that is more static can be provided much more economically on CD ROM than from on-line data bases. There are now economic and financial data bases available on CD ROM that include, in some cases, data that is also available from on-line data bases.

The ability to supply market information in a digitized form rather than analog has made it possible for suppliers of EIS to provide data to user workstations so that it can be manipulated or feed trading systems.

- Although on-line data is still being accessed by dumb terminals in a form that can't be manipulated, there is increasing demand to access and perform operations on market data.
- The ability to manipulate market data has given suppliers of EIS such as Reuters and Telerate the ability to introduce new products in the equity and foreign exchange markets.

Vendors with network capabilities and experience in handling market data can participate in offering electronic trading systems. Reuters has done this with Instinet, which competes for NASDAQ business by allowing institutional traders and index funds to trade with each other rather than using an intermediary.

New or improved network technology has had a positive effect on the use of network services, as noted in Exhibit VIII-1.

 Vendors such as Standard & Poor's Comstock operation have profited from the ability to interface EIS to terminals, wall displays, LANs, PCs, mainframes and networks using dedicated lines, satellite dishes, analytic software and MS Windows capabilities.



 For both EIS and network applications, advancements that improve connectivity between networks or to remote sites or that increase the speed of transmission encourage more use of services.

Most of the vendors of network services offer a limited number of EIS or network applications products and/or sell products in a limited number of markets. Vendors who serve a wide range of products and industries such as CompuServe and GEIS are in the minority.

- Effort is needed to keep track of the many companies offering products that could be useful, according to respondents.
- It is also difficult to find out which vendors have the best combination of products and prices and which are the most stable as suppliers.

As indicated in Exhibit VIII-1, a number of vendors of EIS have allowed their operations to become relatively costly, according to vendors. This year, a few of the larger EIS vendors have taken steps to reduce costs in view of shrinking profit margins.

Vendors of network applications have tended to be more cost effective due to their other business, as well as to the fact that they sometimes have to compete with in-house systems or fax.

Another observation that should be made about the network services market, as mentioned in Exhibit VIII-1, is the increased pressure for the use of EDI or related electronic commerce services.

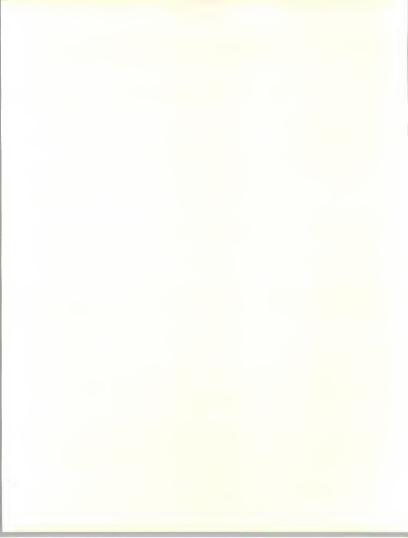
- Major stores and manufacturers have put more pressure on trading partners to conform to their EDI programs so that costs can be lowered and business can be speeded up.
- New services such as EDI\*Express from GEIS have made it easier for companies to respond to trading partners who want them to use EDI.

#### В

#### Recommendations

Network services vendors should review the actions of other vendors offering products in their delivery mode, as Exhibit VIII-2 points out.

 Vendors should consider moves that competitors have made to include more means of interfacing to clients, more subject areas for EIS, and more support services, including processing or systems operations.
 They should also consider more services to a greater number of markets.
 If the forecasts and plans of similar vendors indicate that the market has potential, vendors should consider or take advangage of the existing opportunities.



 Vendors should consider moves made by other vendors to use mergers or alliances with those in other service modes, such as transaction processing, to help them increase services, improve productivity, or share costs. The recent Equifax/Telecredit merger has provided such benefits.

#### **EXHIBIT VIII-2**

### Recommendations

- Review actions of other network services vendors
  - Expand markets and/or services
  - · Offer product variations (e.g., CD/ROM)
  - · Be selective in penetrating industries
- More information services vendors should consider network services

An additional service that vendors of EIS should consider is providing data on CD ROM together with new software products.

- Rather than letting competitive vendors provide this medium for static data in on-line data bases, vendors of EIS could provide CD ROMs along with software products that could organize or provide references between the on-line data and the data on the CD ROMs.
- The approach suggested above could open up opportunities to provide data in new fields or to relate data in different subject areas, which could become a need in the use of on-line data.

Network services vendors should review the differences in usage of products and services in different industries before launching new initiatives

- Where on-line information can increase productivity, as engineering and
  construction data has done; aid sales in financial markets, as on-line
  economic and financial information has done; or reduce costs and
  facilitate business, as EDI has done in distribution, it is much more
  likely to obtain new business.
- Where network services have not been used or are lightly used and are not generally associated with concrete benefits, new products may not have as much opportunity to succeed.



As Exhibit VIII-2 indicates, one of the recommendations that should be made about this service mode is that information services vendors who are not currently offering network services should consider doing so.

- Triad and Reynolds and Reynolds have found that their turnkey services in the auto aftermarket could be supplemented by on-line products that offer information on products needed for repairs.
- ADP has launched a profitable set of services to brokerage offices that includes an EIS.
- Processing services vendors have added network applications to their sets of products and services.





# **Definition of Terms**

#### A

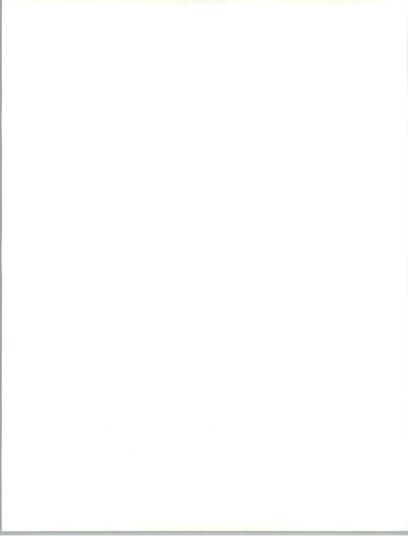
## Introduction

INPUT's Definition of Terms provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions

The changes made in INPUT definitions this year are as follows:

- Systems Operations Submodes the submodes of systems operations have been redefined from processing services and professional services to platform systems operations and applications systems operations.
- Business Services Industry the industry sectors of business services and personal services have been combined into a single business services sector.
- Transportation Industry the information services expenditures relating to airline reservation systems have been returned to the transportation sector where they resided prior to 1990.



### Overall Definitions and Analytical Framework

#### 1. Information Services

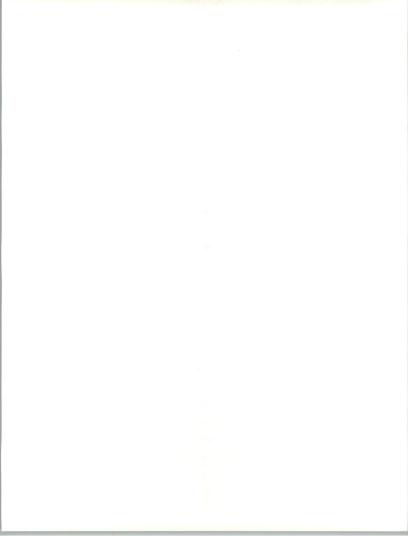
Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Processing of specific applications using vendor-provided systems (called Processing Services)
- A combination of hardware, packaged software and associated support services which will meet a specific application processing need (called Turnkey Systems)
- Packaged software products, either systems software or applications software products (called Software Products)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- Bundled combinations of products and services where the vendor assumes total responsibility for the development of a custom solution to an information systems problem (called Systems Integration)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called Systems Operations)
- Services associated with the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange, on-line data bases, on-line news and data feeds, etc. (called Network Services)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is bundled as part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., EDI or VAN services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user



information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

### 2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

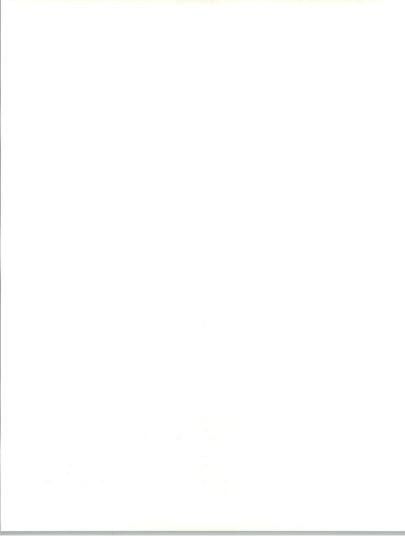
Non-captive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

## 3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While Market Sectors specify who the buyer is, Delivery Modes specify what the user is buying.

Of the eight delivery modes defined by INPUT, five are considered primary products or services:

- Processing Services
- Network Services
- Professional Services
- Applications Software Products
- Systems Software Products



The remaining three delivery modes represent combinations of these products and services, bundled together with equipment, management and/or other services:

- Turnkey Systems
- Systems Operations
- Systems Integration

Section C describes the delivery modes and their structure in more detail.

#### 4. Market Sectors

Market Sectors or markets are groupings or categories of the users who purchase information services. There are three types of user markets:

- Vertical Industry markets, such as Banking, Transportation, Utilities, etc. These are called "industry-specific" markets.
- Functional Application markets, such as Human Resources, Accounting, etc. These are called "cross-industry" markets.
- Other markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the online data base market.

Specific market sectors used by INPUT are defined in Section E, below.

#### 5. Other

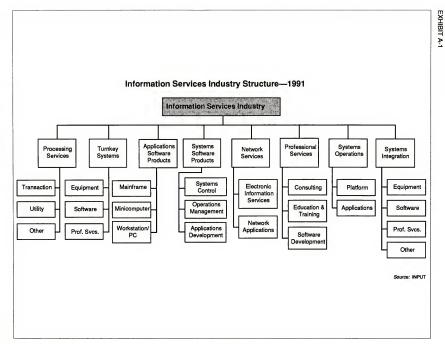
Outsourcing is defined as the contracting of information systems functions to outside vendors. Outsourcing should be viewed as the opposite of insourcing: anything that information systems management has considered feasible to do internally (e.g., data center operations, applications development and maintenance, network management, training, etc.) is a potential candidate for outsourcing.

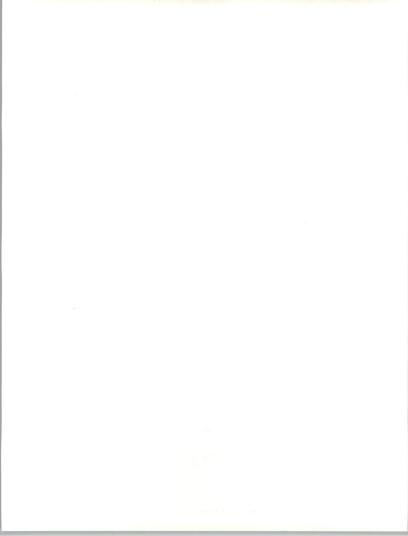
Information systems has always bought systems software, as it is infeasible for companies to develop it internally. However, all other delivery modes represent functions or products that information systems management could choose to perform or develop in-house. Viewed this way, outsourcing is the result of a make-or-buy decision, and the outsourcing market covers any product or service where the vendor must compete against the client firm's own internal resources. Therefore, the entire information services industry can be considered an outsourcing market.

### C

Delivery Modes and Submodes Exhibit A-1 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.







#### 1. Software Products

INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve user purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if bundled in the software pricing, is also included here.

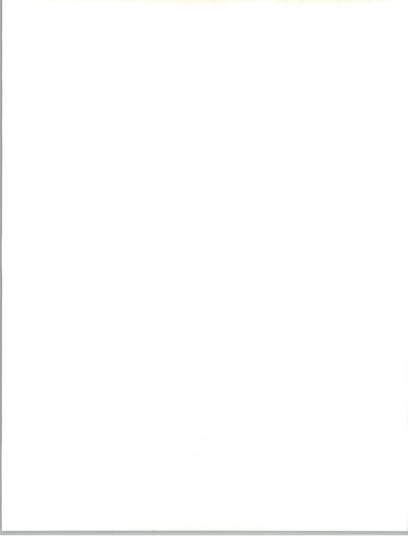
Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself.

#### a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into three submodes.

- Systems Control Products Software programs that function during application program execution to manage computer system resources and control the execution of the application program. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.
- Operations Management Tools Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.
- Applications Development Tools Software programs used to prepare
  applications for execution by assisting in designing, programming,
  testing, and related functions. Included are traditional programming
  languages, 4GLs, data dictionaries, data base management systems,
  report writers, project control systems, CASE systems and other
  development productivity aids. Also included are system utilities (e.g.,
  sorts) which are directly invoked by an applications program.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.



## b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two submodes.

- Industry-Specific Applications Software Products Software products
  that perform functions related to fulfilling business or organizational
  needs unique to a specific industry (vertical) market and sold to that
  market only. Examples include demand deposit accounting, MRPII,
  medical record keeping, automobile dealer parts inventory, etc.
- Cross-Industry Applications Software Products Software products
  that perform a specific function that is applicable to a wide range of
  industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems,
  spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

## 2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom application software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and support services provided. Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for millitary applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

 Value-Added Reseller (VAR): A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or crossindustry market, but also includes many of the other components of a turnkey systems solution, such as professional services.

Turnkey systems have three components:

- · Equipment computer hardware supplied as part of the turnkey system
- Software products prepackaged systems and applications software products
- Professional services services to install or customize the system or train the user, provided as part of the turnkey system sale

## 3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and "other" processing services.

- Transaction Processing Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process transactions and update client data bases. Transactions may be entered in one of four modes:
  - Interactive Characterized by the interaction of the user with the system for data entry, transaction processing, problem solving and report preparation: the user is on-line to the programs/files stored on the vendor's system.
  - Remote Batch Where the user transmits batches of transaction data to the vendor's system, allowing the vendor to schedule job execution according to overall client priorities and resource requirements.
  - Distributed Services Where users maintain portions of an application data base and enter or process some transaction data at their own site, while also being connected through communications networks to the vendor's central systems for processing other parts of the application
  - Carry-in Batch Where users physically deliver work to a processing services vendor.
- Utility Processing Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and/or data bases, enabling clients to develop their own programs or process data on the vendor's system.
- Other Processing Services Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.



## 4. Systems Operations

Systems operations was a new delivery mode introduced in the 1990 Market Analysis and Systems Operations programs. It was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1991 the submodes have been redefined as indicated below.

Systems operations involves the operation and management of all or a significant part of the user's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- Platform systems operations the vendor manages and operates the computer systems, often including telecommunications networks, without taking responsibility for the user's application systems.
- Applications systems operations the vendor manages and operates the computer systems, often including telecommunications networks, and is also responsible for maintaining, or developing and maintaining, the user's application systems.

In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

The ownership of the equipment, which was the previous basis for the systems operations submodes, is no longer considered critical to the commercial market. Most of the market consists of systems operations relationships using vendor-owned hardware. What is now critical is the breadth of the vendor/client relationship as it expands beyond data center management to applications management.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the user's information systems (equipment, networks, systems and/or application software), either at the client's site or the vendor's site. Systems operations can also be referred to as "resource management" or "facilities management."

### 5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information



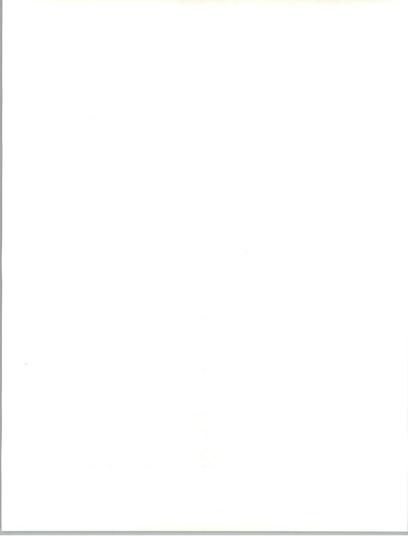
system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

To be included in the information services market, systems integration projects must involve some application processing component. In addition, the majority of cost must be associated with information systems products and/or services.

- Equipment information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- Software products prepackaged applications and systems software products.
- Professional services the value-added component that adapts the
  equipment and develops, assembles, or modifies the software and
  hardware to meet the system's requirements. It includes all of the
  professional services activities required to develop, and if included in
  the contract, operate an information system, including consulting,
  program/project management, design and integration, software development, education and training, documentation, and systems operations
  and maintenance.
- Other services most systems integration contracts include other services and product expenditures that are not easily classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

Systems integrators perform, or manage others who perform, most or all of the following functions:

- Program management, including subcontractor management
- Needs analysis
- Specification development
- Conceptual and detailed systems design and architecture
- System component selection, modification, integration and customization
- Custom software design and development
- Custom hardware design and development
- Systems implementation, including testing, conversion and postimplementation evaluation and tuning



- Life cycle support, including
- System documentation and user training
- · Systems operations during development
- Systems maintenance

#### 6. Professional Services

This category includes three submodes: consulting, education and training, and software development.

- Consulting: Services include management consulting (related to information systems), information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.
- Education and Training: Products and services related to information systems and services for the professional and end user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation.
- Software Development: Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

#### 7. Network Services

Network services typically include a wide variety of network-based functions and operations. Their common thread is that most of these functions could not be performed without network involvement. Network services is divided into two submodes: Electronic Information Services, which involve selling information to the user, and Network Applications, which involve providing some form of enhanced transport service in support of a user's information processing needs.

#### a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers. Users typically inquire into and extract information from the data bases. Although users may load extracted data into their own computer systems, the electronic information

vendor provides no data processing or manipulation capability and the users cannot update the vendor's data bases.

The two kinds of electronic information services are:

- On-line Data Bases Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.
- News Services Unstructured, primarily textual information on people, companies, events, etc.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

## b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and storeand-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

INPUT's market definition covers VAN services only, but includes the VAN revenues of all types of carriers. The following are examples of VAN services.

- Electronic Data Interchange (EDI) Application-to-application exchange of standardized business documents between trade partners or facilitators. This exchange is commonly performed using VAN services. Specialized translation software is typically employed to convert data from organizations' internal file formats to EDI interchange standards. This software may be provided as part of the VAN service or may be resident on the organization's own computers.
- Electronic Information Exchange (EIE) Also known as electronic
  mail (E-mail), EIE involves the transmission of messages across an
  electronic network managed by a services vendor, including facsimile
  transmission (FAX), voice mail, voice messaging, and access to Telex,



TWX, and other messaging services. This also includes bulletin board services.

 Other Network Services - This segment contains videotex and pure network management services. Videotex is actually more a delivery mode than an application. Its prime focus is on the individual as a consumer or in business. These services provide interactive access to data bases and offer the inquirer the ability to send as well as receive information for such purposes as home shopping, home banking, travel reservations, and more.

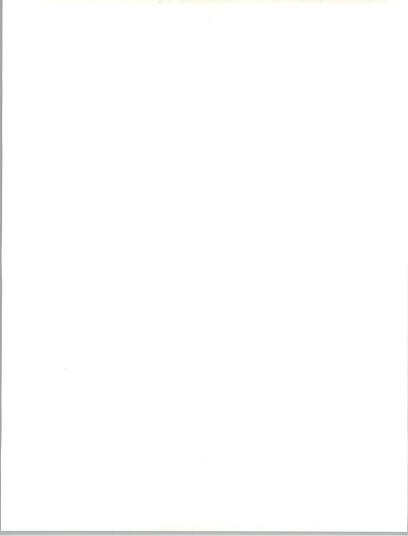
Network management services included here must involve the vendor's network and network management systems as well as people. People-only services are included in professional services that involve the management of networks as part of the broader task of managing a user's information processing functions are included in systems operations.

## D

## Sector Definitions

### 1. Industry Sector Definitions

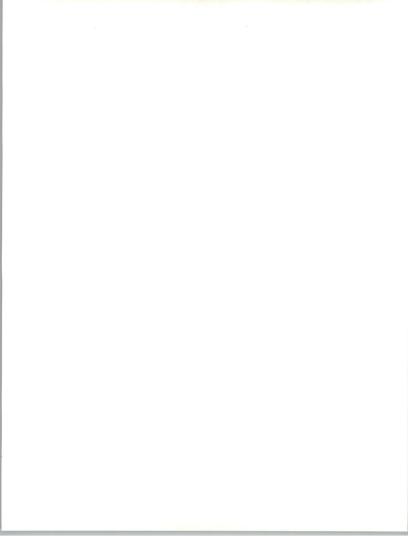
INPUT has structured the information services market into 15 generic industry sectors, such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) Code system. The specific industries (and their SIC Codes) included under these generic industry sectors are detailed in Exhibit A-2.



## **EXHIBIT A-2**

# **Industry Sector Definitions**

Industry Sector	SIC Code	Description		
Discrete Manufacturing	23xx	Apparel and other finished products		
	25xx	Furniture and fixtures		
	27xx	Printing, publishing and allied industries		
	31xx	Leather and leather products		
	34xx	Fabricated metal products, except machinery and transportation equipment		
	35xx	Industrial and commercial machinery and computer equipment		
	36xx	Electronic and other electrical equipment and components, except computer equipment		
	37xx	Transportation equipment		
	38xx	Instruments; photo/med/optical goods;		
	JOXX	watches/clocks		
	39xx			
	JYXX	Miscellaneous manufacturing industry		
Process Manufacturing	10xx	Metal mining		
	12xx	Coal mining		
	13xx	Oil and gas extraction		
	14xx	Mining/quarrying nonmetalic minerals		
	20xx	Food and kindred products		
	21xx	Tobacco products		
	22xx	Textile mill products		
	24xx	Lumber and wood products, except furniture		
	26xx	Paper and allied products		
	28xx	Chemicals and allied products		
	29xx	Petroleum refining and related industries		
	30xx	Rubber and miscellaneous plastic products		
	32xx	Stone, clay, glass and concrete products		
	32xx 33xx	Primary metal industries		
	SSXX	Filliary metal moustries		
Transportation Services	40xx	Railroad transport		
	41xx	Public transit/transport		
	42xx	Motor freight transport/warehousing		
	43xx	U.S. Postal Service		
	44xx	Water transportation		
	45xx	Air transportation (including airline		
		reservation services in 4512)		
	46xx	Pipelines, except natural gas		
	47xx	Transportation services (including 472x,		



## EXHIBIT A-2 (CONT.)

# **Industry Sector Definitions**

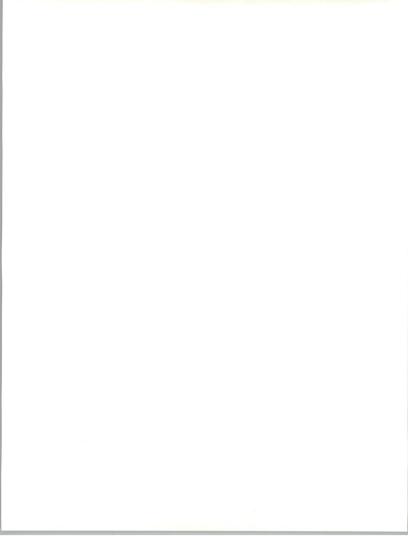
Industry Sector	SIC Code	Description			
Jtilities	49xx	Electric, gas and sanitary services			
Telecommunications	48xx	Communications			
Retail Distribution	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail			
Wholesale Distribution	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods			
Banking and Finance	60xx 61xx 62xx 67xx	Depositary institutions Nondepositary institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices			
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services			
Health Services	80xx	Health services			
Education	82xx	Educational services			



## EXHIBIT A-2 (CONT.)

# **Industry Sector Definitions**

Industry Sector	SIC Code	Description		
Business Services	65xx	Real estate		
	70xx	Hotels, rooming houses, camps, and other		
		lodging places		
	72xx	Personal services		
	73xx	Business services (except hotel reservation		
		services in 7389)		
	7389x	Hotel reservation services		
	75xx	Automotive repair, services and parking		
	76xx	Miscellaneous repair services		
	78xx	Motion pictures		
	79xx	Amusement and recreation services		
	81xx	Legal services		
	83xx	Social services		
	84xx	Museums, art galleries, and		
		botanical/zoological gardens		
	86xx	Membership organizations		
	87xx	Engineering, accounting, research, managemen		
		and related services		
	89xx	Miscellaneous services		
Federal Government	9xxx			
State and Local Government	9xxx			
Miscellaneous Industries	01xx	Agricultural production - crops		
	02xx	Agricultural production - livestock/animals		
	07xx	Agricultural services		
	08xx	Forestry		
	09xx	Fishing, hunting and trapping		
	15xx	Building construction - general contractors, operative builders		
	16xx	Heavy construction - contractors		
	17xx	Construction - special trade contractors		



### 2. Cross-Industry Sector Definitions

In addition to these vertical industry sectors, INPUT has identified seven cross-industry or horizontal market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry. The seven cross-industry markets are:

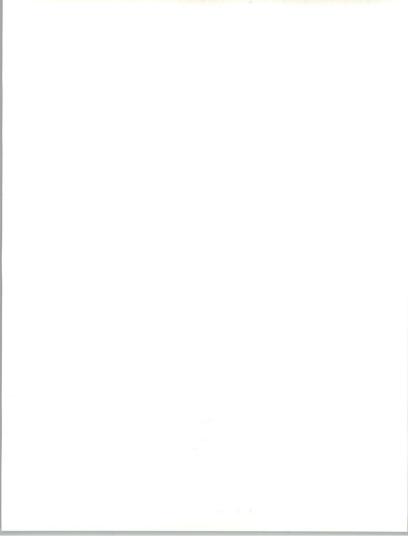
Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation
- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems, as well as the use of computer-based training tools for the training of any employee on any subject.



- The education and training cross-industry sector only considers education and training offered for a noncaptive market; in other words, this sector does not include educational services provided by information services vendors to their customers for training on their own products.
- Education and training that is provided in a classroom setting, live, is not included in this cross-industry sector. This sector is not to be confused with the education industry-specific sector, the subject of another MAP report, which addresses primary and secondary education as a vertical market for IS services.

Office Systems consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Graphics
- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.
- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programs.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management



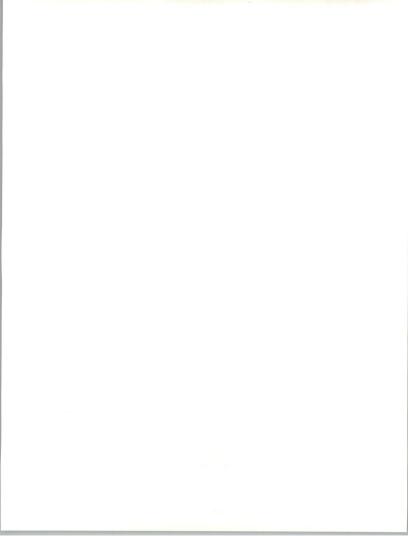
Other encompasses marketing/sales and electronic publishing application solutions.

- · Sales and marketing includes:
  - Sales analysis
  - Marketing management
  - Demographic market planning models
- The fundamental difference between electronic publishing and desktop
  publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from
  a single point—regardless of how many authors/locations work on a
  document—whereas desktop publishing is a personal productivity tool
  and is generally a lower end product residing on a personal computer.
- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

## 3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit A-3 summarizes the relationships.

- Processing services the transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are not considered industry or cross-industry specific and are only forecasted for the total market.
- Turnkey systems all of the turnkey systems delivery mode is considered either industry or cross-industry specific and is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems (equipment, software products and professional services) is forecasted by market sector.
- Applications software products all of the applications software
  products delivery mode is considered either industry or cross-industry
  specific and is forecasted for the 15 industry and 7 cross-industry
  sectors. In addition, each forecast is broken down by platform level:
  mainframe, minicomputer and workstation/PC.
- Systems operations all of systems operations is considered industry specific. Each of the submodes (platform and applications systems operations) is forecasted for each of the 15 industry sectors.

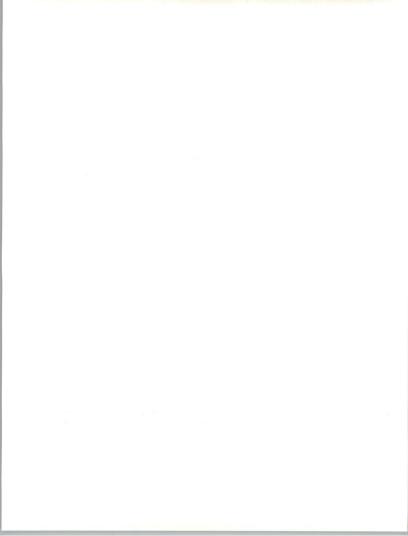


#### **EXHIBIT A-3**

## Delivery Mode versus Market Sector Forecast Content

		Market Sectors		
Delivery Mode	Submode	Industry Sectors	Cross-Industry Sectors	Other
Processing Services	Transaction Utility Other	X	Х	X X
Turnkey Systems		Х	Х	
Applications Software Products		х	Х	
Systems Operations	Platform Applications	X X		
Systems Integration		Х		
Professional Services		Х		
Network Services	Network Applications Electronic Information Services	X		х
Systems Software Products				Х

- Systems integration all of systems integration is considered industry specific. Each of the components of systems integration (equipment, software products, professional services and other services) is forecasted for each of the 15 industry sectors.
- Professional services all of professional services is considered industry specific. Each of the submodes (consulting, education and training, and software development) is forecasted for each of the 15 industry sectors.
- Network services all of the network applications submode of network services is considered industry specific and is forecasted for each of the 15 industry sectors. The electronic information services submode is considered to have both industry-specific and non-specific elements.



The forecast for electronic information systems includes forecasts for the 15 industry sectors as well as an additional forecast component that applies to the market as a whole.

Systems software products - All of the submodes (systems control, operations management, applications development) are considered neither industry- nor cross-industry specific. They are only forecasted in total. In addition, each submode forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.

### E

### Vendor Revenue and User Expenditure Conversion

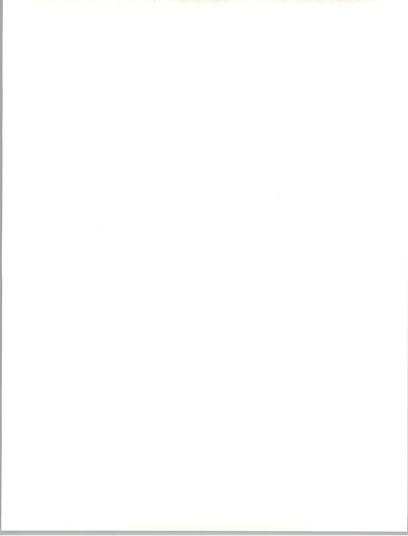
The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. While the primary data for INPUT's research is vendor interviews, INPUT defines and forecasts the information services market in terms of end-user expenditures. End-user expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMS), retailers and distributors). The focus on end-user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., BusinessLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through indirect distribution channels. To capture the valued added through these indirect distribution channels, adjustment factors that incorporate industry discount ratios are used to convert estimated information services vendor revenues to end-user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. And turnkey vendors incorporate purchased software into the systems they sell to end users.

To account for such intra-industry transactions, INPUT uses other conversion ratios to derive the estimate of end-user expenditures.

Exhibit A-4 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to end-user expenditure (market size) figures for each delivery mode.



### EXHIBIT A-4

## Vendor Revenue to User Expenditure Conversion

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	1.00
Systems Integration	0.99
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95



## Forecast Data Base

A

### Forecast Data Base

Exhibit B-1 presents the overall 1990-1996 forecast of user expenditures for the network services delivery mode. Forecasts for the electronic information services and network applications submodes are presented in Exhibits B-2 and B-3.

B

### Forecast Reconciliation

Exhibits B-4, B-5 and B-6 present reconciliations of the forecast data bases for network services and its two submodes with the previous data base forecasts.

User expenditures were close to previously forecast results for network services and its two submodes in 1990, since the impact of the recession had been anticipated for that year.

The forecast results for 1995 reflect a variance in transportation that resulted from discontinuing the consumer services sector after 1990 and moving most of the expenditures in that sector to transportation.

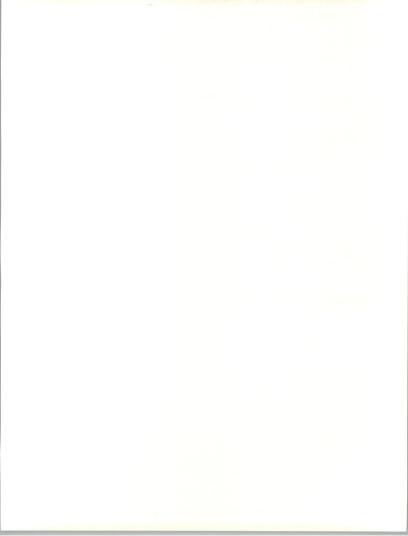
Expenditures for the use of network services and particularly electronic information services in banking and finance were significantly reduced in the entire forecast period due to the continuation of the recession beyond original forecasts and greater use of CD ROM in place of on-line data. Expenditures for the use of EIS in telecommunications were also reduced due to the greater use of CD ROM.



**EXHIBIT B-1** 

## Network Services User Expenditure Forecast by Market Sector, 1990-1996

Market Sectors	1990 (\$M)	Growth 90-91 (%)	1991 (\$M)	1992 (\$M)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	CAGR 91-96 (%)
Delivery Mode Total	8,087	16	9,350	10,782	12,551	14,648	17,141	20,052	16
Vertical Industry Markets	4,953	12	5,627	6,469	7,460	8,632	10,026	11,635	16
Discrete Manufacturing	69	25	86	109	136	171	214	268	25
Process Manufacturing	696	18	825	977	1,157	1,369	1,621	1,920	18
Transportation	270	4	300	354	418	493	582	686	18
Utilities	26	8	28	31	33	36	39	43	9
Telecommunications	93	18	110	129	151	179	214	258	19
Retail Distribution	155	22	187	229	279	341	416	507	22
Wholesale Distribution	221	24	275	338	415	512	620	777	23
Banking & Finance	740	15	850	980	1,125	1,290	1,490	1,710	15
Insurance	208	10	228	252	281	317	361	402	12
Medical	446	13	504	578	675	800	964	1,126	17
Education	163	17	191	224	263	309	362	419	17
Business Services	548	8	592	681	784	902	1,040	1,201	15
Federal Government	1,134	9	1,234	1,333	1,444	1,561	1,686	1,825	8
State & Local Gov't.	76	21	92	111	135	164	201	248	22
Misc. Industries	110	14	125	143	164	188	216	245	14
Generic Markets	3,134	19	3,723	4,313	5,091	6,016	7,115	8,417	18
On-Line Data Bases	2,152	18	2,530	2,888	3,353	3,896	4,528	5,260	16
- Securities	870	17	1,014	1,166	1,352	1,569	1,820	2,110	16
- Credit	1,063	18	1,257	1,420	1,648	1,911	2,217	2,570	16
- Economic/Other	219	18	259	302	353	416	491	580	18
On-Line News Services	982	21	1,193	1,425	1,738	2,120	2,587	3,157	22
- Bibliography/Text	300	22	365	439	536	654	799	976	22
- News	682	21	828	986	1,202	1,466	1,788	2,181	22



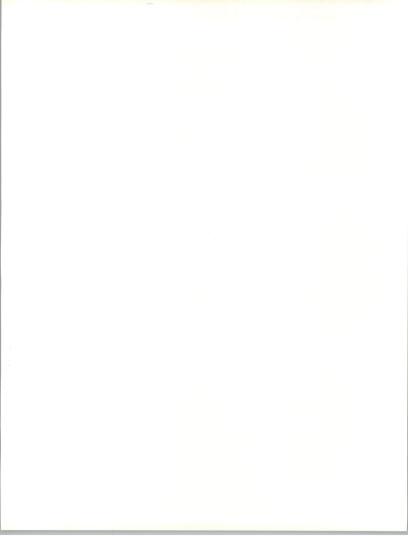
# Electronic Information Services User Expenditure Forecast by Market Sector, 1990-1996

Market Sectors	1990 (\$M)	Growth 90-91 (%)	1991 (\$M)	1992 (\$M)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	CAGF 91-96 (%)
Delivery Mode Total	6,420	16	7,419	852	9,908	11,519	13,408	15,615	16
Vertical Industry Markets	3,286	12	3,696	4,214	4,817	5,503	6,293	7,198	14
Discrete Manufacturing	35	23	43	52	63	76	93	114	21
Process Manufacturing	610	16	708	818	941	1,072	1,215	1,400	15
Transportation	210	8	226	265	308	358	418	486	17
Utilities	23	9	25	37	29	31	34	37	8
Telecommunications	76	18	90	104	122	144	171	204	18
Retail Distribution	107	17	125	148	175	206	243	286	18
Wholesale Distribution	55	15	63	71	81	92	104	118	13
Banking & Finance	650	15	750	860	990	1,140	1,310	1,500	15
Insurance	155	11	171	191	215	245	281	317	13
Medical	274	11	304	338	380	431	493	556	13
Education	102	18	120	142	169	200	235	269	18
Business Services	533	8	575	660	758	870	1,001	1,154	15
Federal Government	315	6	334	353	374	396	416	440	6
State & Local Gov't.	37	19	44	50	58	67	78	90	15
Misc. Industries	104	13	118	135	154	175	201	227	14
Generic Markets	3,134	19	3,723	4,313	5,091	6,016	7,115	8,417	18
On-Line Data Bases	2,168	17	2,530	2,888	3,353	3,896	4,528	5,260	16
- Securities	870	17	1,014	1,166	1,352	1,569	1,820	2,710	16
- Credit	1,063	18	1,257	1,420	1,648	1,911	2,217	2,570	16
- Economic/Other	219	18	259	302	353	416	491	580	18
On-Line News Services	982	21	1,193	1,425	1,738	2,120	2,587	3,157	22
- Bibliography/Text	300	22	365	439	536	654	799	976	22
- News	682	21	828	986	1,202	1,466	1,788	2,181	22



## Network Applications User Expenditure Forecast by Market Sector, 1990-1996

Market Sectors	1990 (\$M)	Growth 90-91 (%)	1991 (\$M)	1992 (\$M)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	CAGR 91-96 (%)
Delivery Mode Total	1,669	16	1,931	2,255	2,643	3,129	3,733	4,437	18
Vertical Industry Markets	1,669	16	1,931	2,255	2,643	3,129	3,733	4,437	18
Discrete Manufacturing	34	26	43	57	73	95	121	154	29
Process Manufacturing	86	36	117	158	216	297	406	520	35
Transportation	60	23	74	89	110	135	164	200	22
Utilities	3	0	3	4	4	5	5	6	14
Telecommunications	17	18	20	25	29	35	43	54	22
Retail Distribution	48	29	62	81	104	135	173	221	29
Wholesale Distribution	166	28	212	267	334	420	516	659	25
Banking & Finance	90	11	100	120	135	150	180	210	16
Insurance	53	8	57	61	66	72	80	85	8
Medical	172	16	200	240	294	369	471	570	23
Education	61	16	71	82	95	109	127	150	16
Business Services	15	13	17	21	26	32	39	47	22
Federal Government	819	10	900	980	1,070	1,168	1,270	1,385	9
State & Local Gov't.	39	23	48	61	77	97	123	158	27
Misc. Industries	6	17	7	9	10	13	15	18	21



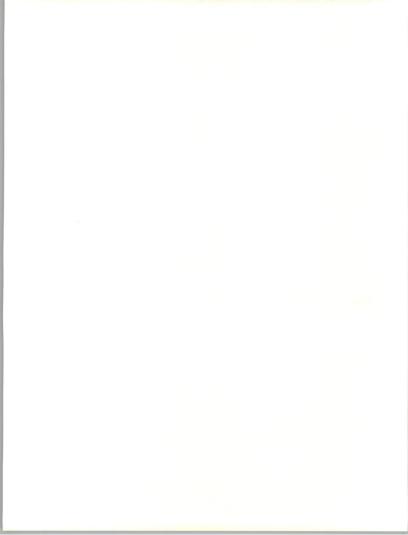
### 1991 MAP Data Base Reconciliation Network Services Market

		1990 N	Market			1995		90-95	90-95	
	1990 1991 Report Report (Fcst) (Fcst)		Variance from 1990 Report		1990 Report (Fcst)	1991 Report (Fcst)	Variance from 1990 Report		CAGR per data 90 rpt	CAGR per data 91 rpt
Delivery Modes	(\$M)	(\$M)	(\$M)	(%)	(\$M)	`(\$M)	(\$M)	(%)	(%)	(%)
Total Network Services Market	8,075	8,087	12	-	17,929	17,141	-788	-7	17	16
Vert. Indus. Mkts.	4,957	4,953	-4	-	10,817	10,026	-791	-7	16	16
Discr. Mfg.	69	69	-	-	201	214	13	6	24	25
Process Mfg.	696	696	-	- 1	1,608	1,621	13	1	18	18
Transportation	170	170	-	-	394	582	188	48	18	28
Utilities	26	26	-	-	39	39	-	-	8	9
Telecom.	91	93	2	2	289	214	-75	-26	26	19
Retail Distr.	152	155	3	2	384	416	32	8	20	22
Wholesale Distr.	221	221	- 1	-	598	620	22	4	22	24
Banking & Finance	746	740	-6	-1	2,019	1,490	-529	-26	22	15
Insurance	208	208	- 1	-	361	361	-	-	12	12
Medical	446	446	- 1	-	964	964	-	-	17	17
Education	163	163	-	-	362	362	-	-	17	17
Bus, Services	515	515	-	-	1,040	1,040	-	-	15	15
Federal Govt.	1,134	1,134		-	1,862	1,686	-176	-9	10	8
State & Local Gov't.		76	-2	-3	212	201	-11	-5	22	22
Misc. Industries	110	110	-	-	216	216	-	-	14	14
Generic Mkts.	3,118	3,134	16	1	7,112	7,115	3		18	18
On-Line Data	2,146	2.152	6	1	4,528	4,528		-	16	16
Bases	, , ,									
- Securities	874	870	-4		1,820	1,820		-	16	16
- Credit	1.056	1.063	7	1	2,217	2,217	-	-	16	16
- Economic/Other	216	219	3	1	491	491	-	-	18	18
On-Line News	972	982	10	1	2.584	2,587	3	-	22	22
Services		70-								
- Bibliography/Text	300	300		- 1	798	799	1		22	22
- News	672	682	10	1	1,786	1,788	2		22	22



## 1991 MAP Data Base Reconciliation Electronic Information Services Market

		1990 N	Market			1995	90-95	90-95		
	1990 Report (Fcst)	1991 Report (Fcst)	Variance from 1990 Report		1990 Report (Fcst)	1991 Report (Fcst)	Variand 1990 R		CAGR per data 90 rpt	CAGR per data 91 rpt
Delivery Modes	(\$M)	(\$M)	(\$M)	(%)	(\$M)	(\$M)	(\$M)	(%)	(%)	(%)
Total Electronic Information Services Market	6,408	6,420	12	-	14,041	13,408	-633	-5	17	16
Vert. Indus. Mkts.	3,290	3,286	-4		6,929	6,293	-636	-9	16	12
Discr. Mfg.	36	35	-1	-3	86	93	7	8	19	22
Process Mfg.	610	610	-	-	1,205	1,215	10	1	15	15
Transportation	128	128	-	-	283	418	135	48	17	27
Utilities	23	23	-	-	34	34	-	-	8	8
Telecom.	77	76	-1	-1	253	171	-82	-32	27	18
Retail Distr.	106	107	1	1	243	243		-	18	18
Wholesale Distr.	55	55	-	-	97	104	7	7	12	14
Banking & Finance	652	650	-2	-	1,783	1,310	-473	-27	22	15
Insurance	154	155	1	1	281	281	-	-	13	13
Medical	274	274	-	-	493	493	-	-	12	12
Education	102	102	-	-	230	235	5	2	15	18
Bus. Services	501	501	-	-	1,001	1,001	-	-	15	15
Federal Govt.	315	315	-	-	419	416	-3	-1	6	6
State & Local Gov't.		37	-2	-5	81	78	-3	-4	16	16
Misc. Industries	104	104	-	-	200	201	1	1	14	14
Generic Mkts.	3,118	3,134	16	1	7,112	7,115	3		18	18
On-Line Data Bases	2,146	2,152	6	1	4,528	4,528		-	16	16
- Securities	874	870	-4	-	1.820	1.820		-	16	16
- Credit	1.056	1.063	7	1	2.217	2,217	- 1	-	16	16
- Economic/Other	216	219	3	i	491	491	-	-	18	18
On-Line News Services	972	982	10	1	2,584	2,587	3	-	22	22
- Bibliography/Text	300	300			798	799	1		22	22
- News	672	682	10	2	1.786	1.788	2	-	22	22



## 1991 MAP Data Base Reconciliation Network Applications Market

		1990 N	/larket			1995	90-95	90-95		
	1990 Report (Fcst)	1991 Report (Fcst)	Variance from 1990 Report		1990 Report (Fcst)	1991 Report (Fcst)	Variand 1990 F	e from eport	CAGR per data	CAGR per data
Delivery Modes	(\$M)	(\$M)	(\$M)	(%)	(\$M)	(\$M)	(\$M)	(%)	90 rpt (%)	91 rp1 (%)
Total Network Applications Market	1,667	1,669	2	-	3,891	3,733	-158	-4	18	17
Vert. Indus. Mkts.	3,290	3,286	-4	-	6,929	6,293	-636	-9	16	12
Discr. Mfg.	34	34	- 1	-	114	121	7	6	28	29
Process Mfg.	86	86	- 1	-	403	406	3	1	36	36
Transportation	42	42	-	-	111	164	53	48	22	32
Utilities	3	3	-	-	5	5	-		10	12
Telecom.	14	17	3	21	36	43	7	19	20	20
Retail Distr.	46	48	2	4	140	173	33	23	25	29
Wholesale Distr.	166	166	-	-	501	516	15	3	25	26
Banking & Finance	94	90	-4	-4	236	180	-56	-24	20	15
Insurance	53	53	-	-	80	80	-		8	8
Medical	172	172	-	-	471	471	-		22	22
Education	61	61	-	-	127	127	-	-	16	16
Bus. Services	14	14	-	-	39	39			22	22
Federal Gov't.	819	819	-	-	1,443	1,270	-173	-12	12	9
State & Local Gov't.		39	-	-	131	123	-8	-6	27	25
Misc. Industries	6	6	-	-	15	15	-	-	21	20

